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Vol. 1058 Number 1

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September 3, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

September 3, 1985 Volume 1058 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

May 7, 1985.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on August 31, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,346,481 through 4,347,628

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,578,036, Re. S.N. 749,612, Filed June 27, 1985, Cl. 140/107, LATTICE FOR THE REINFORCEMENT OF TUBULAR CONCRETE ELEMENTS HAVING A SOCKET METHOD FOR PRODUCING SAID LATTICE AND THE PRODUCTS OBTAINED, Maurice Francois, Owner of Record: *Trefilunion, Paris, France,* Attorney or Agent: Nathaniel R. French, et al., Ex. Gp.: 321

4,142,958, Re. S.N. 751,218, Filed July 2, 1985, Cl. 204/192P, METHOD FOR FABRICATING MULTI-

LAYER OPTICAL FILMS, David T. Wei, et al., Owner of Record: *Litton Systems, Inc., Beverly Hills, Calif.,* Attorney or Agent: Elwood S. Kendrick, et al., Ex. Gp.: 112

4,290,366, Re. S.N. 754,727, Filed July 15, 1985, Cl. 102/202.3, ENERGY TRANSMISSION DEVICE, Florian B. Janoski, Owner of Record: *Atlas Powder Co., Dallas, Tex.,* Attorney or Agent: D. Carl Richards, et al., Ex. Gp.: 221

4,363,732, Re. S.N. 681,874, Filed Dec. 14, 1984, Cl. 210/532.2, INLET AND OUTLET BAFFLE STRUCTURE FOR SEWAGE TREATMENT TANKS, Fred J. Crates, et al., Owner of Record: *Hancor, Inc., Findlay, Ohio,* Attorney or Agent: Thomas E. Kocovsky, Jr., Ex. Gp.: 136

4,404,373, Re. S.N. 727,233, Filed Apr. 25, 1985, Cl. 544/021, PROCESS FOR THE PREPARATION OF 7A-METHOXY-7B-(1,3-DIETHIETANE-2-CARBOXAMIDO) CEPHALOSPORANIC ACID DERIVATIVES, Masaru Iwanami, et al., Owner of Record: *Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan,* Attorney or Agent: Milton J. Wayne, et al., Ex. Gp.: 122

4,414,153, Re. S.N. 731,839, Filed May 8, 1985, Cl. 260/239.1, 1,3-DIETHIETANE-2-CARBOXYLIC ACID PENICILLIN AND CEPHALOSPORIN DERIVATIVES, Masaru Iwanami, et al., Owner of Record: *Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan,* Attorney or Agent: Milton J. Wayne, et al., Ex. Gp.: 126

4,448,012, Re. S.N. 750,192, Filed July 1, 1985, Cl. 53/563, FORMING, FILLING AND SEALING MACHINE, Ivan L. Kauffman, et al., Owner of Record: *Ex-Cell-O Corp., Troy, Mich.,* Attorney or Agent: John P. Moran, et al., Ex. Gp.: 327

4,461,537, Re. S.N. 754,551, Filed July 15, 1985, Cl. 350/96.2, Cl. 350/96.2, FIBER OPTIC CONNECTOR ASSEMBLY, Jack D. Raymer, II, et al., Owner of Record: *Molex, Inc., Lisle, Ill.,* Attorney or Agent: Louis A. Hecht, et al., Ex. Gp.: 251

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,487,782, Reexam. No. 90/000,830, Requested: Aug. 7, 1985, Cl. 424/317, TOPICAL TREATMENT OF NON-INFLAMMATORY ACNE, James A. Mezick, Owner of Record: *Ortho Pharmaceutical Corp., Raritan, N.J.,* Attorney or Agent: Leonard P. Prusak, Ex. Gp.: 125, Requester: Millen and White, Arlington, Va.

COMMISSIONER ORDERED REEXAMINATIONS

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

4,513,838, Reexam. No. 90/000,832, Requested: Aug. 12, 1985, Cl. 180/219, MOTORIZED TWO-WHEELED VEHICLE, Masaharu Tsuboi, Owner of Record: *Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Armstrong, Nikaido, et al., Ex. Gp.: 316, Requester: Commissioner

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Errata

"All reference to Patent No. D. 279,368, to John E. Waters of Waco, Tex. for 'TRUCK TOOL BOX' appearing in the Official Gazette of June 25, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,502,849, to Fumio Nishiguchi of Japan for 'TURBOCHARGER' appearing in the Official Gazette of Mar. 5, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,528,766, to Frank Murabito of Glendale, N.Y. for 'SAFETY ATTACHMENT FOR A MANUALLY-OPERATED WEAPON' appearing in the Official Gazette of July 16, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,529,935, to Kazuaki Kawakita, et al., of Japan for 'METHOD OF AND APPARATUS FOR MAGNETICALLY DETECTING THE THREE-DIMENSIONAL ROTATIONAL POSITION AND MOVEMENT OF AN OBJECT' appearing in the Official Gazette of July 16, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,531,952, to Robert J. Murphy, Jr., of Tex. for 'APPARATUS AND METHOD FOR EXCLUDING GAS FROM A LIQUID' appearing in the Official Gazette of July 30, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,532,585, to Nobuyuki Yoshida of Tokyo, Japan for 'MICRO-PROGRAM CONTROL SYSTEM' appearing in the Official Gazette of July 30, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,535,387, to Go Suzuki, et al., of Japan for 'CERAMIC STRUCTURAL BODY AND A METHOD OF MANUFACTURING THE SAME' appearing in the Official Gazette of Aug. 13, 1985, should be deleted since no patent was granted."

U.S. Department of Commerce
Patent and Trademark Office
Public Advisory Committee for Trademark Affairs
Notice of Open Meeting

In accordance with Section 10(a)(2) of the Federal Advisory Committee Act (Public Law 92–463), announcement is made of the following Committee meeting:

The Public Advisory Committee for Trademark Affairs will meet from 9:30 a.m. until 5:00 p.m. on Sept. 11, 1985, at the U.S. Patent and Trademark Office in Rm. 11C24 of Bldg. 3, Crystal Plz., located at 2021 Jefferson Davis Hwy., Arlington, Va.

The agenda for the meeting is as follows:

(1) Quality of Trademark Examination
(2) Legislative changes to use requirements
(3) Reporting format of the finances of the Trademark Operation
(4) Activities of the Trademark Trial and Appeal Board
(5) Trademark Automated Systems — Practical enhancements to Public Services

The meeting will be open to public observation; approximately twelve (12) seats will be available for the public on a first-come first-served basis.

If time permits, oral comments by the public of three (3) minutes on each topic within the above agenda will be allowed. Written comments and suggestions will be accepted before or after the meeting on any of the matters discussed.

Copies of the minutes will be available upon request.

For further information, contact Ellen J. Seeherman, Office of the Assistant Commissioner for Trademarks, Rm. CP3–11C17, Patent and Trademark Office, Washington, D.C. 20231. Telephone: 703–557–7464.

DONALD J. QUIGG,
Acting Assistant Secretary and Commissioner of Patent and Trademarks.

Aug. 5, 1985.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 3, 1985

PP. 5,338	4,476,693	4,497,385	4,509,311
PP. 5,381	4,476,947	4,497,665	4,509,580
D. 278,521	4,476,975	4,498,383	4,509,688
4,237,785	4,477,336	4,499,924	4,510,158
4,263,651	4,478,747	4,500,495	4,510,305
4,293,816	4,480,317	4,500,651	4,510,367
4,346,436	4,481,456	4,500,704	4,510,547
4,354,225	4,481,652	4,501,091	4,510,778
4,362,108	4,482,395	4,501,725	4,510,896
4,379,218	4,482,495	4,501,992	4,510,923
4,383,121	4,483,751	4,501,998	4,510,931
4,385,022	4,484,422	4,501,999	4,513,029
4,404,083	4,486,304	4,502,264	4,513,669
4,419,415	4,486,431	4,502,537	4,513,869
4,422,868	4,486.899	4,503,431	4,513,882
4,439,388	4,486,910	4,503,505	4,513,907
4,441,948	4,487,192	4,503,696	4,514,291
4,442,300	4,487,607	4,504,074	4,514,968
4,443,454	4,488,116	4,504,377	4,515,402
4,443,753	4,488,579	4,504,460	4,515,450
4,452,608	4,488,926	4,504,613	4,516,278
4,453,171	4,489,068	4,505,105	4,516,634
4,453,965	4,489,203	4,505,231	4,516,911
4,455,737	4,489,424	4,505,308	4,517,195
4,456,873	4,489,699	4,505,406	4,517,215
4,457,854	4,490,258	4,505,653	4,517,354
4,458,307	4,490,828	4,505,822	4,518,033
4,458,821	4,490,875	4,506,049	4,518,411
4,458,822	4,491,140	4,506,187	4,518,643
4,460,480	4,491,523	4,506,200	4,518,675
4,461,267	4,491,529	4,506,286	4,518,874
4,461,292	4,492,328	4,506,605	4,519,536
4,464,966	4,492,991	4,506,773	4,520,129
4,466,189	4,493,568	4,507,257	4,521,725
4,467,002	4,494,927	4,507,492	4,522,095
4,470,148	4,495,253	4,507,794	4,522,380
4,473,369	4,496,030	4,508,064	4,522,795
4,474,568	4,496,688	4,508,186	4,522,926
4,474,613	4,496,754	4,508,572	4,523,307
4,475,078	4,496,914	4,508,704	
4,475,828	4,497,384	4,509,261	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 3, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	12-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	11-30-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-11-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-17-82
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	11-29-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-19-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-23-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-15-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during July 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,395,406 to 3,399,405, inclusive

Plant Patents ..... Numbers 2,825 to 2,829 inclusive

REEXAMINATIONS

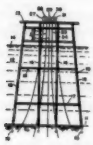
SEPTEMBER 3, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 28,860 (373rd)
CURVED OFFSHORE WELL CONDUCTORS

Peter W. Marshall, New Orleans; Peter Arnold, Kenner, and Francis P. Dunn, New Orleans, all of La., assignors to Shell Oil Company, Houston, Tex.

Reexamination Request Nos. 90/000,412, Jun. 27, 1983 and 90/000,607, Aug. 13, 1984.
Reexamination Certificate for Reissue Patent Re. 28,860, issued Jun. 15, 1976, Ser. No. 326,706, Jan. 26, 1973.
Original No. 3,687,204, dated Aug. 29, 1972, Ser. No. 70,101, Sep. 8, 1970.
Int. Cl.³ E21B *7/04, 7/136, 17/00*
U.S. Cl. 175—9



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **13–15** is confirmed.

Claims **1–3, 5–9, 11, 12, 16, 19, 21–25** and **27–29** are determined to be patentable as amended.

Claims **4, 10, 17, 18, 20, 26** and **30**, dependent on an amended claim, are determined to be patentable.

New claim **31** is added and determined to be patentable.

1. A method for producing hydrocarbons from a subterranean hydrocarbon-bearing formation located beneath the floor of a body of water, said method comprising the steps of:

installing a platform structure on the floor of said body of water above said formation;

extending at least one well conductor downwardly *within* [with respect to] said platform structure, then curving said conductor *from a normally vertical position within said platform structure* outwardly and downwardly through a *portion of the vertical height of* said platform structure above the floor of said body of water *and thence entering the floor of the body of water along a curved path* in a manner maintaining a relatively smooth bore throughout substantially the entire extent of said conductor;

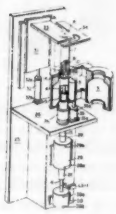
drilling via said conductor down through said floor and into fluid communication with said formation; and

producing formation fluids from said formation via said conductor.

B1 3,733,309 (374th)
BIAXIALLY ORIENTED POLY(ETHYLENE TEREPHTHALATE) BOTTLE

Nathaniel C. Wyeth, Mendenhall, Pa., and Ronald N. Roseveare, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Reexamination Request No. 90/000,597, Jul. 23, 1984.
Reexamination Certificate for Patent No. 3,733,309, issued May 15, 1973, Ser. No. 93,571, Nov. 30, 1970.
Continuation-in-part of Ser. No. 885,853, Dec. 17, 1969, abandoned.
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—35



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–14** is confirmed.

1. A biaxially oriented bottle having a generally cylindrical section wherein the bottle has a density of about 1,331 to 1,402 and is prepared from polyethylene terephthalate having an inherent viscosity of at least about 0.55 with a ratio of the weight in grams of the polyethylene terephthalate to the inside volume of the bottle in cubic centimeters of about 0.2 to 0.005:1, and the generally cylindrical section of the bottle has an axial tensile strength of about 5,000 to 30,000 p.s.i., a hoop tensile strength of about 20,000 to 80,000 p.s.i., an axial yield stress of at least 4,000 p.s.i., a hoop yield stress of at least 7,000 p.s.i., and a deformation constant equal to the slope of the log (reciprocal of the strain rate) versus strain having a value of at least about 0.65 at 50° C.

B1 3,967,308 (375th)
IRRIGATION VALVE WITH METAL SEAT

Calvin A. Lieding, Glendora, Calif., assignor to Irrigation Specialties Company, San Gabriel, Calif.

Reexamination Request No. 90/000,462, Oct. 24, 1983.
Reexamination Certificate for Patent No. 3,967,808, issued Jul. 6, 1976, Ser. No. 615,587, Sep. 22, 1975.
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—46

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2** and **5** are cancelled.

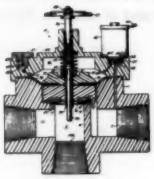
Claims **1, 3, 4** and **6** are determined to be patentable as amended.

Claim 7, dependent on an amended claim, is determined to be patentable.

1. A fluid valve, comprising:

a *molded* valve body made of a plastic material and defining a flow passage therethrough with inlet and outlet conduits at opposite ends of the passage;

a *pre-formed* metal seat ring having a generally U-shaped cross-section defined by a seat portion and a pair of spaced-apart sidewalls extending from the seat portion, the sidewalls being embedded in the plastic valve body *without substantial deformation when the body is molded* to position the seat portion around the flow passage between



the inlet and outlet conduits, at least one of the sidewalls being non-parallel to a central axis of the ring;

an O-ring seal positioned within the seat ring and bearing against the seat ring and plastic body;

a valve closure member mounted in the valve body to be movable into seating engagement with the seat portion to close the valve; and

means on the valve body and connected to the closure member for moving the closure member against and away from the seat portion to close and open the valve[.];

the seat ring terminating in a direction toward the closure member at the seat portion to permit free flow of fluid between the seat ring and closure member lateral to an axis of movement of the closure member when the valve is open.

B1 4,289,563 (376th)

GRATING CONSTRUCTION AND ASSEMBLY METHOD AND APPARATUS

Joseph W. Wiechowski, San Clemente; Delmar S. Miller, Newport Beach, and Richard C. Kostner, Orange, all of Calif., assignors to Poly-Trusions, Inc., Newport Beach, Calif.

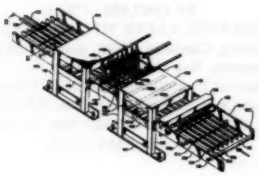
Reexamination Request No. 90/000,479, Dec. 13, 1983.

Reexamination Certificate for Patent No. 4,289,563, issued Sep. 15, 1981, Ser. No. 142,335, Apr. 21, 1980.

Division of Ser. No. 863,766, Dec. 23, 1977, Pat. No. 4,244,768.

Int. Cl.[3] **E04C** *2/22, 2/42*

U.S. Cl. 156—423



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 2 are determined to be patentable as amended.

New claims 3–8 are added and determined to be patentable.

1. Apparatus for manufacturing grating from elongate polymer bonded fiber beams having a width greater than thickness and dowel rods, the beams having holes through the thickness spaced so as to permit said holes to be aligned, comprising:

elongate means *having an entry end and an exit end* for *moveably* supporting a plurality of said beams in spaced relationship with the widths in substantially parallel vertical planes, the dowel rods extending through aligned holes in said beams to form a loosely assembled grating;

a heating zone *proximate the entry end* for heating the beams and dowel rods, *the heating zone comprising means for heating the grating during step-by-step movement of the grating by applying heat to each beam-dowel rod intersection stepwise as the grating is moved through the heating zone;*

a gluing zone including means for applying a predetermined amount of glue to each *succeeding preheated* beam-dowel rod intersection; and

means *comprising moveable elements which repeatedly engage the grating* for moving loosely assembled grating in stepwise fashion for positioning each intersection of beam and dowel rod in the heating zone and in the gluing zone.

B1 4,323,060 (377th)

SPLINT

Jean-Claude R. Pécheux, Charleville-Mézières, France, assignor to Societe Anonyme: Compagnie Generale De Materiel Orthopedique, Charleville-Mézières, France

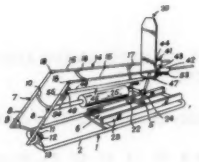
Reexamination Request No. 90/000,445, Sep. 16, 1983.

Reexamination Certificate for Patent No. 4,323,060, issued Apr. 6, 1982, Ser. No. 141,405, Apr. 18, 1980.

Claims priority, application France, Apr. 23, 1979, 79 11181; Nov. 5, 1979, 79 27622

Int. Cl.[3] **A24C** *5/18*

U.S. Cl. 128—84 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 5 and 8 are cancelled.

Claims 1, 2, 6, 7, 9 and 10 are determined to be patentable as amended.

Claims 3, 4, and 11–15, dependent on an amended claim, are determined to be patentable.

New claims 16–27 are added and determined to be patentable.

1. A *portable* splint *which is articulated and automatically movable* for *passive exercising of* a lower limb comprising: a base *adapted to sit on a surface where the lower limb is located,* an assembly having a femoral support member pivoted to said base, a tibial support member pivoted to said femoral support member and having a portion resting on and movable relative to said base, and drive means extending between said femoral support member and tibial support member *and located above said surface, and means for connecting the drive means to said*

assembly for producing relative angular movement between said members and between said members and said base[.], *said tibial support member being provided with a sole plate pivoted thereon on a horizontal axis, bearing means on the sole plate, a coupling member connected between said bearing means and said femoral support member for pivoting said sole plate about said axis in response to relative pivotal movement between said femoral support member and said tibial support member.*

B1 4,352,822 (378th)

GUM BASE, CHEWING GUM CONTAINING SAME AND METHOD

Subraman R. Cherukuri; Dominick R. Friello, both of Danbury, Conn.; Michael Ferroti, Larchmont, N.Y.; Walter Jewell, Mamaroneck, N.Y., and Ronald P. D'Amelia, Hicksville, N.Y., assignors to Nabisco Brands Inc., New York, N.Y.

Reexamination Request No. 90/000,429, Aug. 8, 1983.
Reexamination Certificate for Patent No. 4,352,822, issued Oct. 5, 1982, Ser. No. 216,415, Dec. 15, 1980.
Int. Cl.³ A23G *3/30*
U.S. Cl. 426—4

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2**, **9** and **10** are cancelled.

Claims **1**, **3**, **8**, **15** and **17** are determined to be patentable as amended.

Claims **4–7**, **11–14**, **16** and **18–25**, dependent on an amended claim, are determined to be patentable.

New claims **26–28** are added and determined to be patentable.

1. A chewing gum base which has excellent shelf-life and remains soft over extended periods of time, comprising a polyisobutylene elastomer or a mixture of medium and lower molecular weight polyisobutylene elastomers having a molecular weight within the range of from about 750,000 to 1,300,000, and 37,000 to 80,000, respectively, said polyisobutylene elastomer being present in said base in an amount of at least about 4%, plasticizers comprising *at least one of* glyceryl triacetate *in an amount of from about 0 to about 10% by weight of said gum base* and acetylated monoglyceride *in an amount of from about 0 to about 15% by weight of said gum base,* one or more hydrophilic-type detackifiers *comprising polyvinyl acetate in an amount of from about 10 to about 45% by weight of said gum base,* which absorb saliva and become slippery, one or more filler-texturizing agents, one or more softening agents having a melting point above about 22° C., one or more emulsifiers which function as slip agents and impart hydrophilic properties to the elastomer, and an anti-tack combination comprising a polyterpene resin in an amount of from about 4 to about 25% by weight of said gum base, one or more waxes in an amount of from at least 2% to about 25% by weight of said gum base to enhance bite through characteristics, and optionally a polyethylene wax.

B1 4,355,293 (379th)

ELECTRICAL RESISTANCE APPARATUS HAVING INTEGRAL SHORTING PROTECTION

Barry J. Driscoll, Newport News, Va., assignor to The Bendix Corporation, Southfield, Mich.

Reexamination Request No. 90/000,570, Jun. 4, 1984.
Reexamination Certificate for Patent No. 4,355,293, issued Oct. 19, 1982, Ser. No. 281,804, Jul. 9, 1981.
Continuation of Ser. No. 86,911, Oct. 22, 1979, abandoned.
Int. Cl.³ H01C *10/00*
U.S. Cl. 338—184

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** and **4–11** is confirmed.

Claim **2** is determined to be patentable as amended.

Claim **3**, dependent on an amended claim, is determined to be patentable.

1. A flexible resistive element adapted for connection as a potentiometer comprising:

a flexible web;

a first track overlaid on said web and forming a potentiometer resistor, said first track having a first resistive layer between two limits on said track, a first conductive terminal pad and a second conductive terminal pad each respectively electrically connected to said track outwardly of said two limits;

a second track overlaid on said web and forming a signal terminal, said second track displaced from and substantially parallel to said first resistive layer, said second track including a third conductive terminal pad at one end thereof outwardly of one of said limits; and

resistive means integral with said second track and between said third conductive terminal and said one limit comprising a protection resistor thereby providing integral shorting protection between said third conductive terminal and at least one of said first and second conductive terminals.

B1 4,424,786 (380th)

FUEL SAVING DEVICE

Jean C. Imbert, Orelys, Fox Amphoux, France (83126)

Reexamination Request No. 90/000,619, Sep. 19, 1984.
Reexamination Certificate for Patent No. 4,424,786, issued Jan. 10, 1984, Ser. No. 311,929, Oct. 16, 1981.
Claims priority, application France, Oct. 20, 1980, 80 22411
Int. Cl.³ F02M *27/04;* **B01D** *35/06*
U.S. Cl. 123—538

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–3** are cancelled.

[**1**. The method of treating the fuel supplied to an internal combustion engine having a carburetor, comprising the steps of:

(a) positioning in the air-fuel supply stream to the carburetor a solenoid having a red copper coil, with its axis at right angles to the direction of movement of the air-fuel stream to the carburetor, and energizing the coil to produce a magnetic field surrounding the carburetor,

(b) positioning the coil to cause minimum fuel consumption,
(c) reversing the polarity of the coil at the next change of the full-to-low and low-to-full lunar phase, and
(d) continuing the reversal of polarity with successive changes in the said lunar phases.]

REISSUES

SEPTEMBER 3, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,978

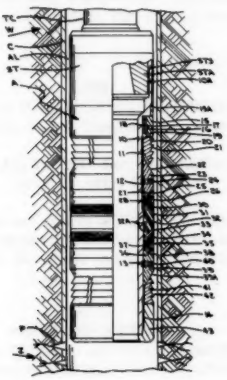
WELL TOOL HAVING KNITTED WIRE MESH SEAL MEANS AND METHOD OF USE THEREOF

David M. McStravick, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Original No. 4,326,588, dated Apr. 27, 1982, Ser. No. 122,225, Feb. 19, 1980. Application for reissue Apr. 25, 1984, Ser. No. 603,629

Int. Cl.³ E21B *33/128, 33/129*

U.S. Cl. 166—387 34 Claims



29. A method of establishing a seal in a subterranean well between a first conduit and an inner wall of a second conduit in said well to prevent fluid communication thereacross; comprising the steps of positioning said second conduit with respect to said first conduit; compressing a knitted wire mesh comprising seamless, knitted elements generally defined by a continuous series of interlocking ductile, metal-containing loop members with a fibrous material introduced among said metal-containing loop members to urge said knitted wire mesh into contact with both said first and second conduits to form a seal therebetween.

31. An apparatus adaptable for insertion on a first conduit within a subterranean well having a second conduit extending therein, and responsive to means for anchoring said apparatus at a predetermined location in a subterranean well, said apparatus comprising seal means for preventing fluid transmission thereacross, said seal means comprising a first sealing element; extrusion preventing back up means preventing extrusion of the first sealing element therepast; and a resilient metallic element, transversely compressible and conformable to the contour of the extrusion preventing means, positioned between the extrusion preventing means and the first sealing element.

Re. 31,979

METHOD OF HULLING PISTACHIO NUTS

Joseph Volk, Sr., Gilroy, Calif., assignor to Benjamin Volk, Gilroy, Calif.

Original No. 4,353,931, dated Oct. 12, 1982, Ser. No. 275,263, Jun. 19, 1981. Application for reissue Oct. 10, 1984, Ser. No. 659,290

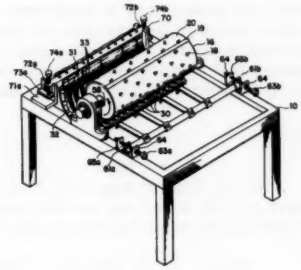
Int. Cl.³ A23N *5/00*

U.S. Cl. 426—483 3 Claims

1. A method of removing hulls from pistachio nuts said method comprising the steps of

(a) depositing unhulled pistachio nuts between rotating means having projections extending outward from a surface thereof and a means having slots, said projections being spaced apart on said surface and said surface movably mounted on support means with said surface having projections disposed in close proximity to [the] *a* surface of said means having slots so that the projections extend into the slots, said slots being narrower than the pistachio nuts;

(b) passing said unhulled pistachio nuts between the surface having projections and [a] *the* surface of said means having slots by means of moving the surface of said means having projections, so as to push said pistachio nuts in said slots with said projections; and



(c) abrading said hulls from said pistachio nuts by means of the surface having projections and the surface of said means having slots contacting said hulls while said unhulled pistachio nuts pass between said surface having projections and said surface of said means having slots.

Re. 31,980

OLFFINIC DERIVATIVES OF AMINO ACIDS

Brian W. Metcalf, Strasbourg, and Michel Jung, Illkirch, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Original No. 3,960,927, dated Jun. 1, 1976, Ser. No. 559,544, Mar. 18, 1975. Application for reissue Jan. 14, 1983, Ser. No. 458,116

Int. Cl.³ C07C *101/28*

U.S. Cl. 562—574 2 Claims

7. The compound 4-amino-5-ene-hexanoic acid or a pharmaceutically acceptable salt thereof.

PLANT PATENTS

GRANTED SEPTEMBER 3, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,547
RED DELICIOUS APPLE TREE-HARED CULTIVAR

Bruner Hare, Long Creek, S.C., assignor to Stark Brothers Nurseries and Orchards Company, Louisiana, Mo.

Filed May 13, 1983, Ser. No. 494,551
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—35 **1 Claim**

1. A new and distinct variety of Red Delicious apple tree, substantially as illustrated and described, characterized by (a) a spur-type tree growth habit similar to the variety of U.S. Plant Pat. No. 2,816, (b) the ability to form roundly conical fruit having a solid dark red blush which is similar to that of U.S. Plant Pat. No. 3,025 in size, shape, and color with the exception that such new and distinct variety is russet resistant, and (c) the ability to form fruit which colors earlier in the season than the varieties of U.S. Plant Pat. Nos. 1,565, 1,916, and 3,578.

5,548
HYGROPHILA POLYSPERMA TROPIC SUNSET

Bradford G. McLane, 700 S. Flamingo Rd., Fort Lauderdale, Fla. 33325

Filed Jul. 11, 1983, Ser. No. 512,426
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of *Hygrophila polysperma* plant as described and illustrated, characterized by leaves whose veins are red under low shade and white under heavy shade.

5,549
ASPARAGUS PLANT

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Oct. 5, 1983, Ser. No. 539,156
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—89 **1 Claim**

1. A new and distinct variety of Asparagus Plant as herein shown and described, distinguished particularly as to novelty by its unique combination as a homogenetic first selfed generation male seedling produced by self fertilization of an andromonoecious male, which transmits only male genes, and which in turn transmits particularly the quality of high yield, resistance to rust (*Puccinia asparagi*), tolerance to root rot (*Fusarium oxysporum*) and crown rot (*F. moniliforme*) and thereby facilitates growth of male hybrids to replace standard cultivars which are susceptible to disease.

5,550
ASPARAGUS PLANT-GREENWICH-53×22-8

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Oct. 5, 1983, Ser. No. 539,157
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—89 **1 Claim**

1. A new and distinct variety of Asparagus Plant as herein shown and described, distinguished particularly as to novelty by the unique combination of homo-genetic characteristics resulting in longer life, with substantially greater production under widely varying conditions of cultivation, having good resistance to rust (*Puccinia asparagi*), good field tolerance to root rot (*Fusarium oxysporum*) and also to crown rot (*F. moniliforme*).

5,551
ASPARAGUS PLANT-JERSEY GIANT

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Oct. 21, 1983, Ser. No. 544,109
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—89 **1 Claim**

1. A new and distinct variety of Asparagus Plant as herein shown and described, characterized as to novelty by the unique combination as an all male hybrid, of high yield ability, resistance to rust (*Puccinia asparagi*) and good field tolerance to root and crown rot (*Fusarium oxysporum* and *F. moniliforme*), with outstanding geographic adaptation, yielding well under widely varying conditions.

PATENTS

GRANTED SEP. 3, 1985

ERRATA

For CLASS	See PATENT NO.
623–016	4,538,304
623–020	4,538,305
623–020	4,538,306
408–072	4,538,354
266–265	4,539,043
419–006	4,539,197
514–006	4,539,204
514–045	4,539,205
514–184	4,539,206
514–072	4,539,207
425–128	4,539,372
525–271	4,539,388
446–014	4,539,406
514–658	4,539,429

PATENTS

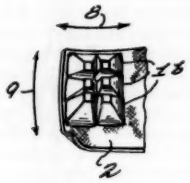
GRANTED SEPTEMBER 3, 1985

GENERAL AND MECHANICAL

4,538,301
PROTECTIVE DEVICE

Harry L. Sawatzki, Schaan, Liechtenstein; Markus Koller, Rudolfstetten, Switzerland, and Hansjörg Schaedler, Eschen, Liechtenstein, assignors to Dierk Filmer, Varel, Fed. Rep. of Germany

Filed Dec. 30, 1982, Ser. No. 454,866
Claims priority, application Switzerland, Dec. 31, 1981, 8368/81
Int. Cl.³ F41H *1/02, 5/04;* A41D *13/00*
U.S. Cl. 2—2 **13 Claims**



1. In a protective device for dissipating energy delivered by an impact or blow from a certain direction:

a series of pressure resistant, stiff elements substantially arranged adjacently to each other, each of said elements having

an outer surface extending in a first plane and being exposed to said energy,

side surfaces extending each in a plane intersecting said first plane and propping against each other, whereby said elements form a rigid shield which essentially follows the course of the body portion to be protected, and

an inner surface opposite to said outer surface;

said elements being frusto-pyramidal type elements having a base surface forming said inner surface, said frusto-pyramidal type elements being arranged in at least two rows; and

stretch resistant material interconnecting said elements at said inner surfaces to allow said elements to flex against said direction and to rigidly shield against said impact or blow.

4,538,302
SNAP CRAVET NECKTIE AND KNOT FORM

Truman D. Thurman, 3617 Tutwiler Ave., Memphis, Tenn. 38122

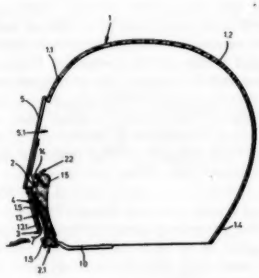
Filed Oct. 9, 1984, Ser. No. 659,180
Int. Cl.³ A41D *25/14, 25/08*
U.S. Cl. 2—150 **1 Claim**

1. The combination of a long, neck-encircling, hand-tied necktie and a knot form within said necktie, said knot form comprising a flexible body shaped as to impart a simulation knot to said necktie when tied at the front of a wearer's neck, said knot form having a longitudinal shape which extends downwardly and outwardly from an upper flap, a middle section and a lower flap, said upper flap having a longitudinal groove therein and being separated from said middle portion by a fold line, a transverse groove separating said middle section from said lower flap, and said lower flap having male and female fastener means symmetrically disposed on either side of the longitudinal center line of the form for maintaining said simulated knot in an attractive symmetrical appearance and having a lower circular edge, said upper flap and said middle portion of said form having thickness which are approximately twice the thickness of said fold line and said lower flap.

4,538,303
PROTECTIVE HELMET

Willibald Schnitzler, Neu-Ulm, Fed. Rep. of Germany, assignor to Romer GmbH, Neu-Ulm, Fed. Rep. of Germany

Filed Jul. 29, 1983, Ser. No. 518,358
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 8229801
Int. Cl.³ A63B *71/10*
U.S. Cl. 2—424 **12 Claims**



1. A protective helmet comprising:

an impact-resistant shell adapted to substantially fully enclose the head of a user and including a chinpiece having upper and lower edges, said shell being formed with a window frontwardly of the location at which the face of a user would be disposed upon wearing of the helmet, with said upper edge of said chinpiece defining the lower boundary of said window;

a visor mounted on said shell for closing said window;

at least one air inlet opening formed in said chinpiece; and

a shaped member in said shell lying along and rearwardly of said chinpiece, said member and said chinpiece being spaced from each other to define therebetween at least one upwardly open passage for air entering through said air inlet opening to flow along, said member having its front-

wardly directed surface shaped to guide said air and direct it, upon leaving said passage, upwardly and substantially uniformly over the rearwardly directed surface of said visor over the full expanse of said window for inhibiting fogging of said visor.

4,538,304

BONE IMPLANT

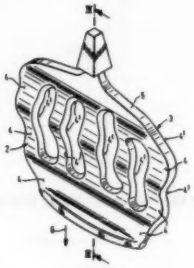
Hans L. Grafelmann, Parkstrasse 105, D-2800 Bremen 1, Fed. Rep. of Germany

Continuation of Ser. No. 448,492, Dec. 10, 1982, abandoned. This application Oct. 31, 1984, Ser. No. 666,143

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1981, 3150490

Int. Cl.³ A61F *1/00*

U.S. Cl. 623—16 **3 Claims**



1. In a bone implant for securing artificial teeth to a jaw bone, comprising a substantially flat body plate having an outer end and an inner end and two broadsides, each of which is formed with transversely spaced apart, elongated depressions, which are transverse to the direction from said outer end to said inner end,

the improvement comprising said depressions defined by softly curved corrugations merging into adjoining portions of said broadsides without forming a sharp edge therewith and being free of undercut surfaces, so as to facilitate removal of the implant without tearing off body tissue and while retaining existing friction between the jaw bone and the implant, the corrugations formed in one of said two broadsides being staggered from those formed in the other of said two broadsides, each of the corrugations having a longitudinal center plane and being symmetrical with respect to said longitudinal center plane, and the body plate being provided with a plurality of openings closed on all sides thereof, and being enlarged in thickness at said inner end thereof forming an arch-shaped blunt bead extending along the entire length of said inner end thereof, in order to promote the application of pressure by said inner end of the body plate to surrounding body tissue.

4,538,305

ARTICULATED PROSTHESIS

Eckart Engelbrecht, Hamburg; Elmar Nieder, York, and Arnold Keller, Kaihude, all of Fed. Rep. of Germany, assignors to GMT Gesellschaft für medizinische Technik mbH and Waldemar Link GmbH & Co., both of Hamburg, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,638

Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119841

Int. Cl.³ A61F *1/00*

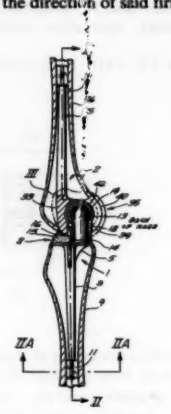
U.S. Cl. 623—20 **9 Claims**

1. An articulated prosthesis, particularly an internal prosthesis, comprising:

(a) a pair of components arranged to be situated on opposite sides of a joint and to engage corresponding parts of the anatomy;

(b) a hinge on one of said components for permitting pivotal movement of said components relative to one another about a first axis, said hinge including a hinge pin which is guided by the other of said components so as to permit relative rotation of the latter and said pin about a second axis transverse to said first axis; and

(c) a pair of mounting members on said one component which are spaced in the direction of said first axis and are



arranged to support said pin, said one component being provided with a pair of openings for supporting said mounting members, and each of the latter including a tubular mounting section which is received in the respective opening and accommodates a portion of said pin, each of said mounting members further including a rim extending radially of said first axis, and said rims bearing against said one component to thereby prevent movement of said mounting members away from one another in the direction of said first axis.

4,538,306

IMPLANTABLE ELBOW JOINT

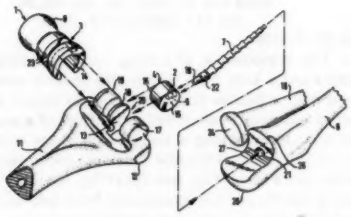
Erhard Dörre, Plochingen; Peter Prüssner, Dietzenbach, and Ludwig Zichner, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 22, 1983, Ser. No. 506,687

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 3223925

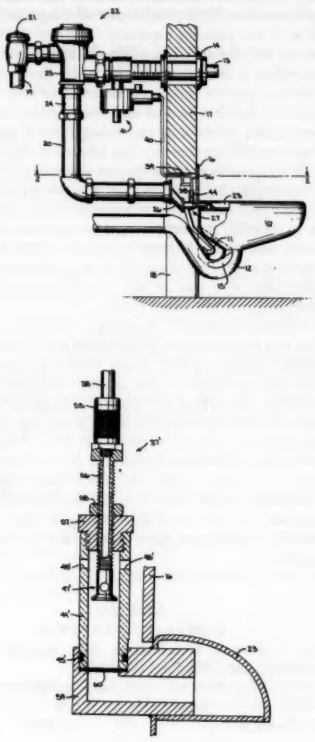
Int. Cl.³ A61F *1/04*

U.S. Cl. 623—20 **12 Claims**



1. An implantable elbow joint for connecting the upper arm and the forearm, comprising an axially extending sleeve having a C-shaped cross-section transversely of the axial direction thereof for embracing the at least partly resected trochlea of

the humerus with the contact extending about the axis of said sleeve for an angular extent of more than 180°, said sleeve having an inside surface and an outside surface, the outside surface of said sleeve serving as an abutment for supporting the radius, and a connecting member implantable in the ulna, wherein the improvement comprises that said sleeve being mechanically connectible to the trochlea, said sleeve having a slot extending in the radial direction of the sleeve from the inside surface to the outside surface thereof and being elongated in the circumferential direction thereof, the inside surface of said sleeve defines an interior cylindrically shaped surface at least in the region of said slot and extending in the axial direction of said sleeve at least slightly beyond the opposite sides of said slot, an axially extending cylindrically substantially disc shaped sliding member is supported in said sleeve in the region of said slot and between resected surfaces of said trochlea and in sliding contact with said cylindrically shaped surface and said respected surfaces of said trochlea, said sliding member has the axial dimension greater than the dimension of said slot in the axial direction of said sleeve, and said connecting member comprises an elongated shaft having a first end and a second end with the first end arranged to extend into and to be mechanically anchored within the ulna and the second end being arranged to project out of the ulna through said slot and into closely fitting engagement within said sliding member.



4,538,307

FLOOD LEVEL SENSOR FOR FLUID FILLING SYSTEMS

Thomas G. Barnum, Fox Point; William A. Smart, Jr., Germantown, and Donald H. Mullett, Hartland, all of Wis., assignors to Bradley Corporation, Menomonee Falls, Wis.

Filed Aug. 3, 1984, Ser. No. 637,297
Int. Cl.[3] E03D *11/18, 11/02*
U.S. Cl. 4—427 14 Claims

1. In a flood preventer mechanism having an orifice to which a partial vacuum is communicated for controlling the level of fluid in a receptacle with an enclosed rim, the improvement comprising:

an upstanding tube which is disposed outside and extends above the enclosed rim;

means for providing fluid communication between the upstanding tube and the enclosed rim;

means for locating the orifice within the tube at a height related to a limit on the level of fluid in the receptacle; and

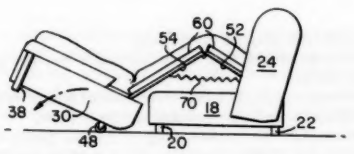
wherein the upstanding tube forms a vent to the atmosphere above the orifice, the vent being in communication with the orifice inside the tube to maintain atmospheric pressure in a gap between the orifice and fluid entering the tube from the receptacle.

4,538,308

CONVERTIBLE FURNITURE

Nikita Grigoriev, P.O. Box 107, Jordanville, N.Y. 13361

Filed Dec. 9, 1983, Ser. No. 559,987
Int. Cl.[3] A47C *17/13*
U.S. Cl. 5—37 C 7 Claims



1. An article of furniture which is usable in any of the following modes: as a bed or couch; as a chair or sofa; a recliner; a sick bed or day bed for convalescents and which also provides an enclosed storage area which comprises three hingedly interconnected subassemblies as follows

a first subassembly consisting of a rear support beam from which two side support members extend forward each of said side members being connected to said rear support by fasteners, legs secured to the side members and to the rear support at their intersection, a center support member

fastened to the center of said rear support and extending forwardly of said rear support member, legs secured adjacent to the forward end of each of said side members and said center member, and a pair of hinges adjacent the top of said rear support member;

a second subassembly comprising a storage and front portion including a front support member, four rearwardly extending support members, fastened to said front support member the first two of said rearwardly extending members being sideboards and being further secured to said front support member by legs located at the intersection of said front support member and said rearwardly extending members at their intersection; the other two of said rearwardly extending support members being spaced apart so as to straddle the center support member of the support beam; and a floor fastened to the four sides defined by said front support, one of said first two rearwardly extending sideboards and one of said other rearwardly extending members and said cross brace;

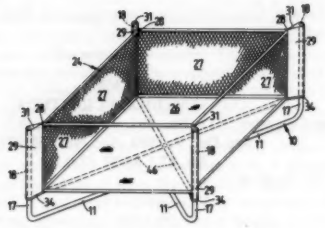
and a third subassembly hingedly connected to each of said first and said second subassemblies, and consisting of three panels, namely a first panel which is shorter than the forwardly extending side support members of said first assembly and which is hingedly connected along its rear edge to said rear support beam a second panel hingedly connected at its rear edge to the front edge of said first panel and hingedly connected at its front edge to the rear edge of a third panel; said third panel being hingedly connected to the front support member of said second subassembly, said third panel being shorter than the rearwardly extending support members of said second subassembly.

4,538,309

PORTABLE PLAYPEN

Rebecca C. Gunter, Birmingham, Ala., assignor to Portable Technology, Inc., Birmingham, Ala.

Filed Nov. 14, 1983, Ser. No. 551,104
Int. Cl.³ A47D *13/06*
U.S. Cl. 5—99 B **10 Claims**



1. A portable playpen comprising:

(a) a disassemblable base frame disposed to rest on a supporting surface,

(b) elongated upright members connected to said base frame in position to define upstanding corner posts,

(c) a one piece fabric unit having rectangular panels defining a box-like compartment having a bottom panel joined along its edges to upstanding side panels with adjoining edge portions of adjacent side panels secured to each other,

(d) sleeve-like members connected to said adjoining edge portions of adjacent side panels and extending outwardly thereof in position to telescope downwardly over an adjacent corner post with each said adjacent corner post in spaced relation to said adjoining edge portions adjacent thereto with said sleeve-like members defining vertically extending web-like members between said corner posts and said box-like compartment so that said box-like compartment is supported inwardly of and in spaced relation to said corner posts, and

(e) means limiting downward movement of said sleeve-like members relative to said corner posts.

4,538,310

APPARATUS FOR COMFORTING AN INFANT

Norma J. Scott, 4510 W. Hope St., Milwaukee, Wis. 53216

Filed Mar. 7, 1983, Ser. No. 472,598
Int. Cl.³ A47G *9/00*
U.S. Cl. 5—437 **3 Claims**

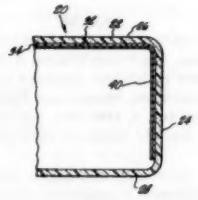
1. An apparatus for comforting an infant, comprising a support, a pair of arms pivotally connected to the support and movable between an open position and a closed position wherein said arms embrace an infant, each of said arms terminating in a hand portion, said hand portions being capable of being disposed in proximate relation when the arms are in the closed position, each arm comprises an inner arm section pivotally connected to said support and an outer arm section pivotally connected to the inner arm section, and drive means associated with at least one of said arms for moving said arm in a reciprocating path of travel toward and away from said support to thereby provide a gentle patting action for comforting said infant, said drive means includes a motor and a cam driven by said motor, said cam having an eccentric cam surface and said drive means including connecting means operably connecting said cam surface to said hand, whereby rotation of said cam will cause said hand to move in said reciprocating path.

4,538,311

SELF-SEALING PUNCTURABLE ARTICLE

Charles P. Hall, Santa Rosa; Joseph Philipson, Pasadena, and John B. Johenning, Los Angeles, all of Calif., assignors to Monterey Manufacturing Co., Carson, Calif.

Continuation-in-part of Ser. No. 474,545, Mar. 11, 1983, abandoned. This application Jul. 25, 1983, Ser. No. 517,222
Int. Cl.³ A45F *1/00*; A47C *27/08*; E04C *5/02, 7/00*
U.S. Cl. 5—451 **16 Claims**



1. A waterbed mattress comprising a flexible top wall, a flexible side wall, and a flexible bottom wall, each wall having an inside surface for holding water in the mattress, at least one of the walls comprising:

(a) an outer, flexible puncturable sheet formed of a polymeric material sheet, the sheet being less than 100 mils thick;

(b) a middle layer of a self-sealing, water-resistant sealing material for sealing punctures in the sheet, the middle

layer being less than 100 mils thick, the sealing material being sufficiently tacky that it adheres to the sheet and can be pulled into a puncture in the sheet by the object that causes the puncture, the sealing material having a sufficiently high viscosity at 100° F. that it does not flow through a puncture in the sheet, the sealing material comprising a polyurethane elastomer; and

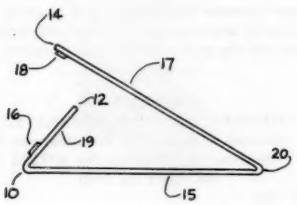
(c) an inner anti-tack barrier adhered to the layer of the sealing material for preventing the layer of sealing material from sticking to itself.

4,538,312

PLAYPEN PAD COVER

Gabriella M. Marki, 2060 NE. Second Ave., Pompano Beach, Fla. 33060, and Katalin Ross, 12710 SW. 197th Ter., Miami, Fla. 33183

Filed Jun. 6, 1983, Ser. No. 501,427
Int. Cl.³ A47G 9/04
U.S. Cl. 5—499 **8 Claims**



1. A reversible, fitted playpen pad cover for use on a playpen pad for a playpen, the playpen having substantially vertical walls and a floor, the playpen cover comprising:

(a) an upper panel of fabric having a rectangular area substantially the same as the area of the floor of said playpen;

(b) a lower panel of fabric having substantially the same area and shape as that of said upper panel, said lower panel integrally secured to said upper panel along three of four respective edges of said upper and lower panels, thereby leaving one unclosed pair of edges between said panels, thus defining a flexible closure length between said upper and lower panels;

(c) a rectangular lip panel of fabric integrally depending from said upper panel along the unclosed edge thereof, said lip panel foldable into said closure between said upper and lower panels, said lip panel having two edges that extend transversely from the line of dependency with said upper panel secured between said upper and lower panels along the two secured parallel edges of said upper and lower panels, thereby leaving one closure defined by said upper and lower panels, in which the width of said lip panel comprises between twenty and thirty-five percent of the width of said upper panel;

(d) means for resealably sealing the unclosed side of said lower panel, to the side of said lip panel opposite to said lower panel along substantially the entire closure lengths of said panels,

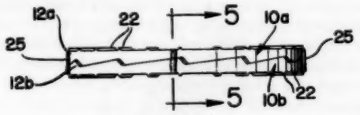
whereby a playpen pad may be readily fitted under said lip panel and between said lip panel and said upper panel, thereby effectuating a firm securement of the playpen pad into said playpen cover which, after insertion of the pad thereinto, is wholly stable and completely reversible and is inaccessible to an infant.

4,538,313

METHOD OF FORMING A JOINED PAIR OF WEDGE-ACTION LOCK WASHERS

Bengt O. Frieberg, La Habra Heights, Calif., assignor to Nobex AB, Mattmar, Sweden

Filed Feb. 15, 1980, Ser. No. 121,840
Int. Cl.³ B21D 53/20
U.S. Cl. 10—86 B **4 Claims**



1. A method of forming a single lock-washer unit composed of a pair of mating lock washers, comprising the steps of:

forming a pair of washers, each having a frictional surface and an opposing cam surface;

applying a releasable securing means to the cam surface of at least one washer thereof, said releasable securing means comprising a bonding material that allows the mating washers to be freely separated by the relative rotational forces applied to said washers;

mating the opposing cam surfaces of each of said washers to form a signle lock-washer unit;

said cam surfaces comprising a frontal cam wall and a rearwardly inclined cam surface;

wherein the opposing frontal walls are spaced apart to allow movement therebetween; and

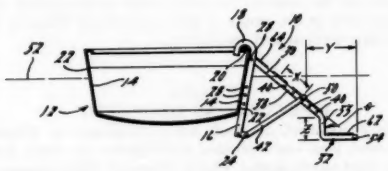
selectively applying said bonding material to at least one inclined cam surface.

4,538,314

BOARDING RAMP

Kenneth M. Baranowski, 71020 Weeks Rd., Richmond, Mich. 48602, assignor to Kenneth M. Baranowski, Kendallville, Ind.

Filed Jul. 5, 1983, Ser. No. 511,013
Int. Cl.³ E01D 1/00
U.S. Cl. 14—71.1 **13 Claims**

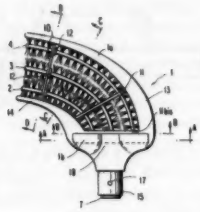


1. A ramp for aiding a dog into a boat; having a substantially vertical wall portion extending from water upon which said boat is floating, said ramp comprising an inclined planar member having first and second ends opposite one another, said member including means for removably attaching said first end to said vertical wall portion of said boat and means for extending said member into the water; and means for aiding a dog onto said boat via said inclined planar member comprising a platform secured to the second end of said planar member and disposed entirely below the surface of said water when said inclined planar member is operably secured to said boat in said water wherein said platform is disposed in a substantially horizontal position when said inclined planar member is touched by a forward portion of said dog attempting to mount said boat from said water to accommodate a rearward portion of said dog to ease access of said dog into said boat without aid from any other source as the boat rolls during the mounting process into said boat by said dog.

4,538,315
DENTAL HYGIENE APPARATUS HAVING A PLURALITY OF ROTATING BRUSHES

Frédéric Barth, 11, Place du Marché, Chevry II, 91190 Gif-sur-Yvette, France

Filed Aug. 17, 1983, Ser. No. 524,062
Int. Cl.³ A46B *13/02*
U.S. Cl. 15—23 **9 Claims**



1. A dental hygiene apparatus having a plurality of incurvated flexible rotating brushes for simultaneously cleaning the teeth of two opposed mandibles by brushing in a gum to tooth direction, said apparatus comprising

a housing for mounting said brushes,

said housing defining an open brush holder being shaped as an arcuate sector and having a length and incurvated shape matching that of two opposed half dental arches,

said open brush holder portion including an inner tongue-guard and a cheek guard,

said tongue-guard and said cheek guard being spaced apart by at least two transverse spacers,

said plurality of brushes consisting of five incurvated brushes mounted in an H-shaped configuration on said spacers, said H-shape being formed by mounting each of four of said five brushes on said spacers at the four ends of said H-shaped configuration and by mounting the fifth of said five brushes at a center point of the horizontal leg of said H-shaped configuration,

and means for simultaneously rotating said brushes,

said housing including upper and lower restrictions defining a biting portion for receiving the upper and lower incisor teeth of the opposite two half dental arches to lock said apparatus in the mouth as said apparatus is bitten by the incisor teeth at said restrictions.

4,538,316
PIPE CLEANING EQUIPMENT

Alberto J. Reinhart, deceased, late of Düdingen; by Edoardo Reinhart, legal representative, 6777 Quinto; by Fabio Reinhart, legal representative, Piazza Riforma 9, 6900 Lugano, all of Switzerland; by Federico Reinhart, legal representative, Rhodebach 9, D-5135 Selfkant 1, Fed. Rep. of Germany; by Giacomo Reinhart, legal representative, Hauptstrasse 58, 3186 Düdingen, Switzerland, and by Pietro Reinhart, legal representative, Raiffeisenstrasse, D-5135 Selfkant-Heilder, Fed. Rep. of Germany

Filed Apr. 28, 1983, Ser. No. 489,343
Int. Cl.³ B08B *9/02*
U.S. Cl. 15—104.06 R **20 Claims**

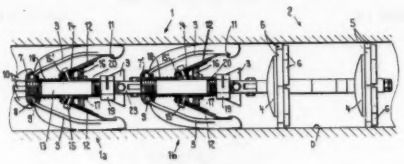
1. A pipe cleaning apparatus for a pipe having a pipe wall with a nominal inner diameter comprising:

at least one propulsion unit for moving said apparatus within the interior of the pipe; and

a cleaning unit for removing deposits from the pipe wall, said cleaning unit having an opposed hinged connection with said propulsion unit operable to permit said cleaning unit at least two degrees of freedom of movement with respect to said propulsion unit for passage of both units through bends in the pipe, said cleaning unit having an axial length and a nominal outer diameter both approximately equal to the pipe nominal inner diameter, said cleaning unit including:

a head member;

a plurality of rigid cutter arms each having an axial length approximately equal to the pipe nominal inner diameter as well as a first end pivotally connected to said head member at a pivotal connection so that said cutter arms are operable to pivot in a generally radial direction with respect to said head member, a peripheral edge of said



cutter arms defining said cleaning unit nominal outer diameter, each of said cutter arms also having second ends distal said first ends;

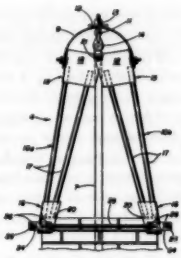
means for biasing said cutter arms radially outwardly with respect to said head member for maintaining contact between the pipe wall and said cleaning unit while said cleaning unit is maneuvered through the bends; and

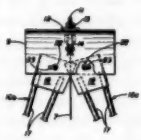
said head member also limiting said cleaning unit outer diameter to approximately equal to said cutter arm axial length and the pipe nominal inner diameter.

4,538,317
CHIMNEY CLEANING APPARATUS

Maurice L. Sorensen, P.O. Box 92, Weyarhaeuser, Wis. 54895

Filed Mar. 21, 1983, Ser. No. 477,250
Int. Cl.³ F23J *3/00*
U.S. Cl. 15—163 **10 Claims**





1. A chimney cleaning device, comprising:

a brush support housing mountable on top of the chimney, said support housing including a support member and a plurality of legs each pivotally connected to said support member and to one of its adjacent legs at one of their ends for varying the position of their other ends in a first directional plane to accommodate chimneys of various dimensions;

pivotal means connected to said support member and said one ends of said legs for adjusting the pivotal connection of said legs with said support member for varying theposition of said one ends of said legs with respect to said

support member in a second directional plane transverse to said first plane;

a cleaning brush suspended from said support housing for cleaning the inside of the chimney; and

means for moving the cleaning brush up and down within the chimney.

4,538,318

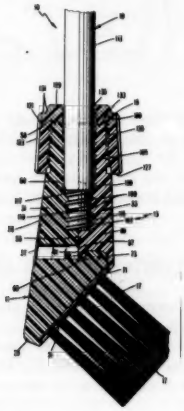
PUSH BROOM ASSEMBLY

James E. Lammert, Cincinnati, Ohio; Charles E. Nichols, Woodridge, and John R. Howard, West Chicago, both of Ill., assignors to The Drackett Company, Cincinnati, Ohio

Filed Dec. 29, 1983, Ser. No. 566,642

Int. Cl.³ A46B *15/00, 5/02*

U.S. Cl. 15—171 **36 Claims**



19. An improved push broom assembly comprising:

(a) unitary shroud means;

(b) neck means including a cavity therein;

(c) handle means releasably retained in said cavity;

(d) said neck means including a first portion that is formed as a part of said shroud means, said first portion having a recess, and a second portion removably inserted into said recess in the first portion, said first and said second portions forming said cavity; and

(e) whereby, removal of said second piece from said first piece allows removal of said handle means from said cavity.

4,538,319

ROLLER BRUSH FOR SWEEPING MACHINES

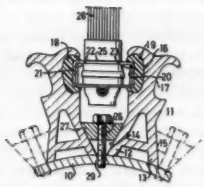
Walter Droeser, Ragnaröksgatan 7, S-72355 Västerås, Sweden

Filed Feb. 28, 1984, Ser. No. 584,388

Claims priority, application Sweden, Mar. 8, 1983, 8301258

Int. Cl.³ A46B *13/02*

U.S. Cl. 15—183 **1 Claim**



1. A roller brush for sweeping machines including a cylindrically shaped central tube carrying a plurality of axially aligned bristle bars, said bristle bars having bristle bundles thereon arranged in rows, the bristles bars having a substantially rectangular cross section with side edges and being displaceably retained by their side edges in axial retaining means, characterized in that a plurality of axially aligned light-metal sections are clamped with equal spacing around the circumference of the cylinder, each of said sections being symmetrical in cross-section and having a foot end engaging portion against the central tube and a radially outward end portion which is provided with axially aligned grooves forming seatings for either side of said outward end portion, each of said foot ends having opposing sides which diverge away from each other in the radial direction toward the central tube to form wedge sufaces, said central tube having threaded holes between said light-metal sections, wedge members having wedge surfaces thereon and being clamped between said light-metal sections by screws tightened down into the threaded holes in the cylinder, the wedge surfaces of the wedge members coacting with the wedge surfaces of the light-metal sections for clamping the light-metal sections against each other into a ring and pressing the ring into rigid engagement against the cylinder, said grooves of the light-metal sections being accommodated by retaining bars formed of plastic material, and wherein each of said retaining bars are formed with channels therein for retaining the side edges of said bristle bars.

4,538,320

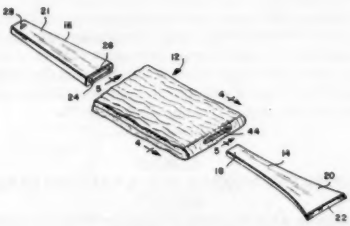
SCRAPER WITH MITT

Thomas N. Batt, R.R. 1, Swisher, Iowa 52338

Filed Apr. 30, 1984, Ser. No. 605,163

Int. Cl.³ A47L *17/06*

U.S. Cl. 15—236 R **8 Claims**



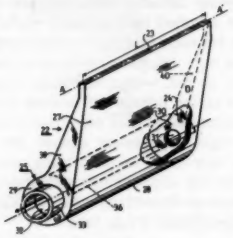
1. A device for removing snow and ice from a windshield, comprising a rigid two-part handle—a first part embodying an elongate handgrip, said first part having at an end opening bounded by an end face, a second part embodying a blade, said second part being structured to be inserted into the opening in the first part and a mitt positioned about the handle and secured thereto at a position thereon to cover the handgrip and to leave the beveled blade exposed, said mitt containing at one end an opening for receiving the handle, said opening at said one end of the mitt being so dimensioned that the insertion of the second part into the opening in the first part anchors the material of the mitt bounding said opening at said one end of the mitt against said end face and said mitt at the other end defining an opening sufficiently large to admit a gloved or ungloved hand for grasping the handgrip.

4,538,321

APPARATUS FOR REMOVING EXCESS DEVELOPER PARTICLES ON THE SURFACE OF A RECORDING ELEMENT

Jean-Jacques Binder, Valdoie, and Bernard Cherbuy, Belfort, both of France, assignors to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Jun. 20, 1983, Ser. No. 505,980
Claims priority, application France, Jul. 22, 1982, 82 12831
Int. Cl.³ G03G *15/00*
U.S. Cl. 15—306 R **20 Claims**



1. In a device for removing excess developer particles adhering to a surface upon which a powdery developer has been deposited, said device comprising:

a suction conduit (22) having a port at each of two terminations, one of said ports being a first air inlet port (23) shaped in the form of a slot and running parallel to said surface in the immediate vicinity thereof, the other port being an air outlet port (24);

and a cylindrical chamber (25) integral with said suction conduit (22), and located at said outlet port (24) with an axis running parallel to the direction of elongation (AA') of said first inlet port (23), said cylindrical chamber having side walls (29, 30) one of which (29) has a suction port (32) communicating with a suction source (35), said chamber (25) further having on its cylindrical wall (28) a port (36) which corresponds to the air outlet port (24) of said suction conduit;

the improvement comprising the other of said side walls (30) of said chamber (25) having a second air inlet port (31) communicating with the atmosphere, and wherein the ratio of the cross-sectional area of said first air inlet port (23) to that of said suction port (32) ranges from 0.3 to 0.7 and the ratio of the cross-sectional area of said first air inlet port (23) to that of said second air inlet port (31) ranges from 2 to 20.

4,538,322

ATTACHMENT NOZZLE FOR A VACUUM CLEANING SYSTEM

Heinz-Jürgen Ahlf, Bergisch Gladbach; Wieland Gühne, Remscheid; Peter Wulf, Ennepetal, and Hans-Peter Simm, Wuppertal, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jun. 6, 1984, Ser. No. 617,730
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 8405468[U]
Int. Cl.³ A47L *9/04*
U.S. Cl. 15—387 **7 Claims**

1. An attachment nozzle for a vacuum cleaning system such as a portable vacuum cleaner, built-in vacuum cleaning arrangement or the like, the attachment nozzle comprising:

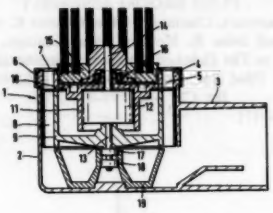
a housing attachable to the vacuum cleaning system, said housing having a front end portion;

a brush rotatably mounted in said front end portion of said housing;

annular air inlet means for admitting and adjusting the flow of a stream of suction air into said housing, said air inlet means being arranged at an outer peripheral region of said housing;

an air turbine rotatably mounted in said housing in the path of said stream of suction air so that said air turbine is rotatably driven thereby;

separate encapsulated gear means for operatively connecting said air turbine to said brush; and,



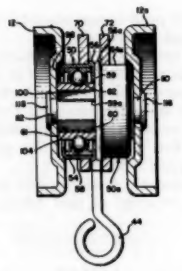
a fixed wall structure mounted in said housing centrally of said annular air inlet means and defining cup-shaped recess means for removably receiving said gear means therein, said cup-shaped recess means facing into the interior of said housing and away from said brush.

4,538,323

BEARING SUPPORTED TRUCK ASSEMBLY FOR SLIDING DOOR

Larry Johnson, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed Feb. 24, 1983, Ser. No. 469,239
Int. Cl.³ B60B *37/00*
U.S. Cl. 16—98 **3 Claims**



1. A truck assembly for suspending a door panel or the like, from a hanger track, said truck assembly being moveable along said track and comprising: a carriage assembly including hanging means for suspending a door panel, and at least a pair of wheel members carried by said carriage assembly and engageable with said track, said carriage assembly further including; a pair of apertured spaced plates; a pair of discrete pre-assembled self-contained bearing arrangements, each of said arrangement includes an axially inner and an axially outer end portion, an outer shell member having an abutment means formed on the exterior peripheral surface thereof adjacent an axially inner end thereof, and, a central, apertured hub member; and an axle member having a wheel member mounted to each end thereof, said pre-assembled self-contained bearing arrangements each being mounted on said axle in oppositely facing relation with said axle being received through the central, apertured hub of each said bearing arrangement, and one said bearing arrangement being disposed in each said plate aperture with the axially, inner ends of said bearing arrangements being in juxtaposition and with the plate member engaging the abutment means

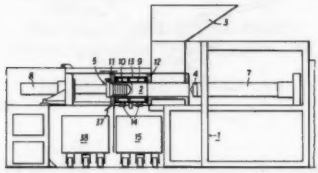
on the outer shell member of the bearing arrangement, such that said plate member maintains said bearing arrangements in clamped assembly therebetween, and means for holding the plate members in assembled relation.

4,538,324

APPARATUS FOR SEPARATING MEAT FROM BONES

Otto Prosenbauer, Vienna, Austria, assignor to Inject Star Pokelmaschinen GmbH, Vienna, Austria

Filed May 22, 1984, Ser. No. 612,824
Int. Cl.³ A22C *25/16*
U.S. Cl. 17—1 G **6 Claims**



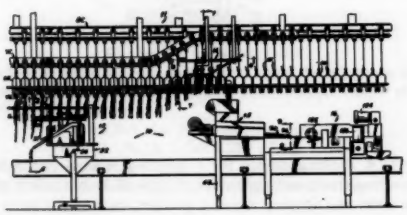
1. Apparatus for severing the meat from bones by pressing the mass of meat and bones introduced into the cylindrical press cavity of a press between a press piston and a counter-piston, said apparatus comprising passage openings within the wall of the press cavity, through which openings the meat can pass having been brought into the pasty condition under the action of the press pressure, whereas the bones are retained, noting that both pistons can be moved in axial direction of the press cavity and that the counter-piston releases during its movement directed away from the press piston a discharge opening for discharging the pressed bones from the press cavity, further noting that the counter-piston has a closing section of greater diameter than the diameter of the press cavity and a filter section, provided with further passage openings for pasty meat, of smaller diameter than the diameter of the press cavity, said filter section extending in closing position of the counter-piston into the press cavity and being, however, separated from the wall of the press cavity by an annular space, and further noting that the wall of the press cavity is formed at least within the area of the counter-piston by a perforated filter and that also the filter section of the counter-piston forms a perforated filter and that this filter section has the same outer diameter over the length of its perforated filter.

4,538,325

GIZZARD HARVESTING MACHINE

Grover S. Harben, Jr.; James S. Ellis, and Joe M. Emmett, all of Gainesville, Ga., assignors to Centennial Machine Company, Inc., Gainesville, Ga.

Division of Ser. No. 179,516, Aug. 19, 1980, Pat. No. 4,382,313. This application May 9, 1983, Ser. No. 492,595
Int. Cl.³ A22C *21/06*
U.S. Cl. 17—45 **11 Claims**



1. In a viscera processing system for separating the gizzard from the food intake and digestive portions of the gastrointestinal tract of the viscera where the gizzard with the food intake and digestive portions of the gastrointestinal tract still attached thereto through the tenderlining section is conveyed along a poultry processing line by overhead conveying means so that the gizzard and attached food intake and digestive portions of the gastrointestinal tract of each bird remains associated therewith as the bird and associated viscera are conveyed along the processing line with at least the digestive portion of the gastrointestinal tract dangling below the birds, the improvement including:

length adjusting means positioned a prescribed distance below the overhead conveying means so that those portions of the gastrointestinal tract dangling below the birds moving along the poultry processing line moves past said length adjusting means, said length adjusting means adapted to mechanically and automatically cut off those portions of the gastrointestinal tract dangling below the level of said length adjusting means while leaving the viscera conveyed by the overhead conveying means along the processing line;

viscera separating means for separating the gizzard from the food intake and digestive portions of the gastrointestinal tract; and

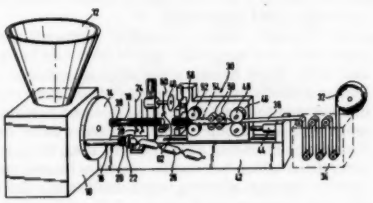
transfer means for engaging the viscera including the gizzard with both the food intake and digestive portions of the gastrointestinal tract still attached as the viscera is conveyed by the overhead conveying means along the processing line to separate the viscera from being conveyed by said overhead conveying means and mechanically transferring the viscera automatically from the conveying means into said viscera separating means so that the viscera separating means separates the food intake and digestive portions of the gastrointestinal tract from the gizzard.

4,538,326

PROCESS AND APPARATUS FOR AUTOMATED MANUFACTURE OF LINK SAUSAGES HAVING CASINGS FORMED OF SYNTHETIC TUBULAR MATERIAL

Günter Kollross, Am Wallerstadter Weg 20, 6081 Dornheim, Fed. Rep. of Germany

Continuation of Ser. No. 430,017, Sep. 30, 1982, abandoned. This application Aug. 25, 1983, Ser. No. 526,225
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938371; Oct. 16, 1979, 2941872
Int. Cl.³ A22C *13/02*
U.S. Cl. 17—49 **4 Claims**



1. A process for the automatic manufacture of sausages of the type having a casing formed of synthetic tubular material wherein the respective sausage links are closed at one of their ends, then filled with forcemeat and closed at their other end, comprising the following steps:

supplying synthetic tubular material from a reel to a shirring station,

shirring a relatively long length of said tubular material, which has a moisture content for stuffing, onto a receiving element, in a first operation, to form a hollow body of shirred tubular material,

and taking each hollow body of shirred tubular material, individually, and placing same onto the outlet opening of a sausage stuffing machine, stuffing forcemeat into the tubular material, concurrently pushing out the shirred folds and closing the ends of the respective sausage links,

wherein the supplied tubular material, before the shirring operation, is continuously kept open by means of a special guide body separate from the receiving element and coaxial therewith, the said guide body being stationary during the shirring step, and

wherein said shirring step takes place while a previously formed shirred length of tubular material, which was transferred to the stuffing outlet following shirring, is being stuffed,

and further including cutting off a length of shirred material between the guide body and the receiving element and closing one end of said shirred tubular material after cutting off and stuffing.

4,538,327

SEPARATING AND CLEANING DEVICE FOR SHELLFISH

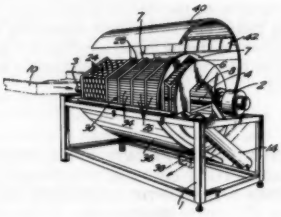
Gudbjartur Einarsson, Hafnarfjord, Iceland, assignor to Veltak H/F, Hafnarfirdi, Iceland

Filed Mar. 14, 1983, Ser. No. 475,108

Claims priority, application Iceland, Mar. 18, 1982, 2711

Int. Cl.³ A22C *29/00*

U.S. Cl. 17—53 **12 Claims**



1. A separating and cleaning machine for selecting shellfish within a predetermined range of sizes, comprising:

an inner rotatable drum connected to a central rotary shaft and formed with a plurality of relatively large openings dimensioned to allow shellfish within said predetermined range to pass therethrough, said inner drum having an inlet end leading to the interior thereof;

means for feeding a catch brought on board a vessel into said inlet end of said inner drum;

an outer rotatable drum arranged in surrounding relation about said inner drum and spaced from said inner drum, said outer drum having a plurality of openings smaller than said relatively large openings of said inner drum and dimensioned to retain shellfish within said predetermined range within said outer drum, said outer drum having a first section extending a given length along the axis of said outer drum which has smaller openings therein including circular openings allowing waste shellfish of a size smaller than said predetermined range to fall out from said outer drum, and said outer drum having a second section downstream of said first section and extending a given length along the axis of said outer drum, said second section having longitudinal openings therein for allowing waste including half shells from shellfish within the predetermined range to fall out from said outer drum;

means for rotating said shaft to rotate said inner and outer drums;

means for receiving waste dropped through said openings of said outer drum and for removing said waste; and

means for receiving shellfish within said predetermined range from within said outer drum at an exit end thereof.

4,538,328

DEVICE FOR INTERRUPTING FEED OF A ROVING TO A DRAWING FRAME

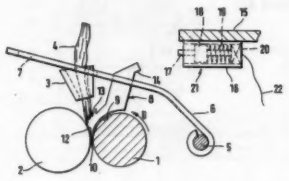
Gerd Stahlecker, Eislingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed May 15, 1984, Ser. No. 610,504

Claims priority, application Fed. Rep. of Germany, May 25, 1983, 3318925

Int. Cl.³ D01H *13/16, 13/18*

U.S. Cl. 19—0.25 **10 Claims**



1. A device for interrupting feed of a roving to a drawing frame having a feed roller pair associated therewith, the feed roller pair including a powered bottom roller and a top roller tensioned against the bottom roller, the device comprising clamp means introduceable from the feed side between the top roller and the bottom roller for interrupting feed of the roving, said clamp means including a clamping edge and a tongue means and being disposed on a lever means pivotable about an axis parallel to the axes of the feed roller pair, said clamping edge and said tongue means being shiftable with the clamp means in the feed direction of the roving for engaging and clamping the roving against the circumference of top roller and lifting the top roller away from the bottom roller, respectively.

4,538,329

DRAFT DEVICE

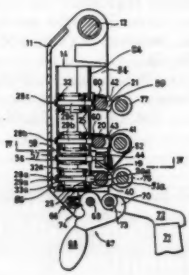
Shoji Sakai; Michiaki Fujiwara; Nobunori Kubota, all of Kyoto, and Koshi Noda, Joyo, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Oct. 29, 1981, Ser. No. 316,298

Claims priority, application Japan, Oct. 31, 1980, 55-155887[U]; Oct. 31, 1980, 55-155888[U]; Nov. 7, 1980, 55-159946[U]

Int. Cl.³ D01H *5/86, 5/46*

U.S. Cl. 19—244 **6 Claims**



1. A drafting device for a spinning machine, including a machine frame and a plurality of pairs of double rollers placed in series and adapted to run in parallel, each of said pairs comprising a top double roller and a bottom double roller, wherein each of the top double rollers is supported by a common shaft and the common shafts of said top double rollers are supported

in a top roller support, and wherein one of the pairs of double rollers is provided with endless aprons and is adapted to be an apron drafting mechanism and have its top rollers provided with a tenser for tensioning said aprons, characterized in that the top roller support for supporting the shafts of the top rollers is pivotably supported at one of its ends at the machine frame, and that an engaging member is disposed at the other free end of the top roller support for releasably securing the top roller support to the machine frame.

4,538,330

VENETIAN BLIND ASSEMBLY APPARATUS

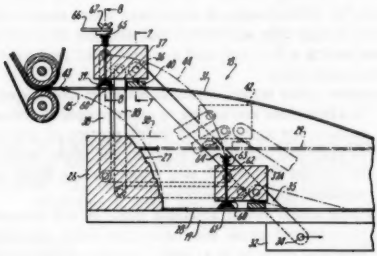
Gerardus H. Edixhoven, Voorschoten, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Jun. 16, 1983, Ser. No. 504,975

Claims priority, application United Kingdom, Jul. 16, 1982, 8220688

Int. Cl.³ B23P *19/04*; B65H *5/08*

U.S. Cl. 29—24.5 **6 Claims**



1. A venetian blind assembly apparatus for assembling a supply of fully formed blind slats to at least two ladder cords by individually introducing said slats between adjacent cross rungs of said ladder cords where said apparatus has a slat feeding device for individually feeding slats to an infeed end of a slat ladder cord assembly unit and a machine base supporting said feeding device and assembly unit; said feeding device comprising:

(a) a headstock upstanding from one end of said base;

(b) a slat magazine cradle disposed longitudinally of and mounted on said base below said assembly unit and capable of holding a stack of fully formed slats having leading ends disposed adjacent said headstock;

(c) means mounted adjacent said headstock for individually picking up slats near their leading ends from said stack and presenting the leading ends sequentially to said headstock; and,

(d) means within said headstock for redirecting and propelling slats presented thereto to the infeed end whereby said slats are inverted as they travel from said cradle to said infeed end.

4,538,331

METHOD OF MANUFACTURING AN INTEGRAL BLADED TURBINE DISK

Michael J. Egan, Milford, and Gary J. Quill, Birmingham, both of Mich., assignors to Williams International Corporation, Walled Lake, Mich.

Filed Feb. 14, 1983, Ser. No. 466,168

Int. Cl.³ B21K *3/04*; B23P *15/02, 15/04*

U.S. Cl. 29—156.8 R **1 Claim**

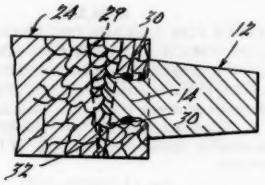
1. A method of making a turbine rotor comprising the steps of

arranging a plurality of blades having dovetails at the radially inner ends thereof in circumferentially spaced circular array,

coating the dovetails of said blades with a diffusion bonding material comprising an Ni-Cr-B alloy,

casting a metallic hub about the dovetails of said blades resulting in a diffusion bond between said hub and the dovetails of said blades, and

directing an electron beam of relatively narrow radial dimension in a direction parallel to the central axis of said hub and through a zone of relatively small radial dimension spaced radially inwardly from the outer perimeter of said hub and encompassing the radially innermost portion only of the diffusion bond between the dovetails of said blades and said hub thereby to modify the grain structure of the diffusion bond in said zone from a granular to a columnar configuration and move any voids in said diffusion bond zone radially outwardly to enhance vibration dampening.



4,538,332

METHOD FOR THREADING SPOKES ON A SPOKE WHEEL HUB

Julien Carminati, Annecy-le-Vieux, France, assignor to Centre de Production Mecanique, Epagny, France

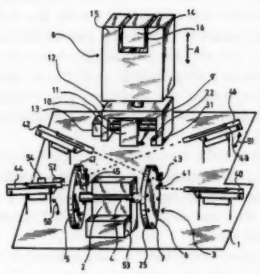
PCT No. PCT/FR82/00099, § 371 Date Feb. 18, 1983, § 102(e) Date Feb. 18, 1983, PCT Pub. No. WO82/04421, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 17, 1982, Ser. No. 474,598

Claims priority, application France, Jun. 19, 1981, 81 12561

Int. Cl.³ B21F *39/00*

U.S. Cl. 29—159.02 **5 Claims**



1. A method for threading spokes into holes provided in flanges of spoke wheel hubs, each flange having corresponding holes, comprising the following steps:

disposing the hub (3) horizontally and braking its rotation with braking means producing a braking torque greater than the drive torque produced by the weight of spokes when mounted on the hub;

rotating the hub by drive means (9) to bring a first hole (29) of the hub into a predetermined position (27) for insertion of a first spoke thereinto;

threading a spoke into each of the corresponding holes of each flange in predetermined directions so that they pass

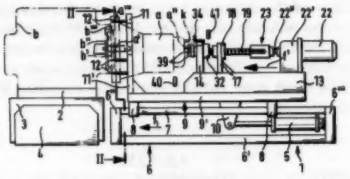
to the side of the other flange, and after introduction, letting them hang under the action of their own weight;
rotating the hub and bringing the next first free hole into the predetermined position (26);
continuing with threading spokes and rotating the hub until all the spokes are introduced; and
removing the hub fitted with spokes.

4,538,333

APPARATUS FOR ASSEMBLING TWO TELESCOPING PARTS, OF WHICH AT LEAST ONE HAS A RADIALLY DIRECTED PROJECTION

Jindrich Cettl, Hilgertshausen, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Oct. 14, 1982, Ser. No. 434,373
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1981, 3141332
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—240 **16 Claims**



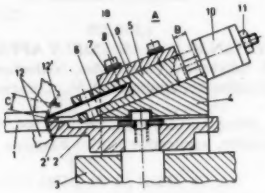
1. An installation for assembling two parts adapted to be telescoped into one another, of which one part includes an axially directed projection which during telescoping of the parts engages into a correspondingly constructed recess of the other part, comprising
means for holding a first one of said two parts against axial displacement,
means for aligning the second part with the first part,
means for rotating the second part about its longitudinal axis and for simultaneously axially displacing the second part to assemble the second part with the first part,
retaining means for receiving the second part and for positioning the second part with respect to the first part in relation to a longitudinal center axis, spring loaded compression means for engaging the second part, slippage clutch means for engaging the spring loaded compression means, and
threaded spindle means held by a rigid mounting means, for driving the slippage clutch means wherein the second part is a transmission input shaft installed in a vehicle transmission, the transmission input shaft comprising external toothed means,
the first part comprising a clutch friction disk of a friction clutch means provided on a motor vehicle engine,
the friction disk comprising internal toothed means receiving the external toothed means of the transmission input shaft, and wherein
the retaining means comprises mounting plates arranged at the forward edge of the feed carriage means having a substantially rectilinear outer configuration, extending perpendicularly to the plane of the feed carriage means, and
the retaining means further comprises three forwardly projecting mounting bolts means coordinated each to a through-bore means at a transmission flange means as well as at an engine flange means, the mounting bolt means having free end sections constructed conically shaped.

4,538,334

SEAM FOLDING MACHINE

Rudolf Binggeli, Meisterschwanden, Switzerland, assignor to Emil Suter Maschinenfabrik AG, Seon, Switzerland

Filed Sep. 20, 1983, Ser. No. 534,068
Claims priority, application Switzerland, Sep. 21, 1982, 5573/82
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—243.5 **9 Claims**



1. A jointing machine for manufacturing seamed metal sheets by folding seams in segmented metal sheets, said seam having a back side and a front side and said front side of said seam having a first part and a second part, said jointing machine comprising:
support roller means, rotatable about an axis perpendicular to a first place and having an outer periphery and an upper surface, for supporting at least a portion of said first part of said front side of said seam on said upper surface parallel to said first plane, said upper surface being disposed adjacent said outer periphery;
locking wheel means, rotatable about an axis perpendicular to a second plane and having an outer periphery, for applying pressure to at least a portion of said second part of said front side of said seam to fold said at least a portion of said second part of said front side of said seam onto said at least a portion of said first part of said front side of said seam;
locking wheel carriage means, movable parallel to said second plane and disposed above said support roller means, for supporting said locking wheel means for rotation about said axis perpendicular to said second plane with said outer periphery of said locking wheel means proximate said outer periphery of said support roller means, said first plane and said second plane forming an acute angle therebetween;
adjustment roller means, rotatable in a plane parallel to said first plane and having an outer periphery, for contacting the back side of said seam with said outer periphery and supporting said back side of said seam against movement in a direction parallel to said first plane, said outer periphery of said adjustment roller means being disposed proximate the outer peripheries of said support roller means and said locking wheel means.

4,538,335

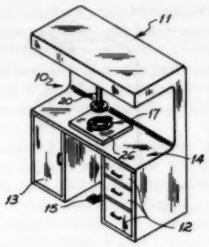
EMBROIDERY FRAME PRESS

Edgar F. Moore, III, 4447 Old Randleman Rd., Greensboro, N.C. 27405

Filed Jun. 29, 1984, Ser. No. 626,530
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—251 **4 Claims**

1. An embroidery framing device comprising: a plunger head, a shaft receiving hub, said hub joined to said plunger head, shaft securing means, said shaft securing means positioned on said hub for securing a shaft in said hub, said hub having a smaller diameter than said plunger head, said plunger head including a flange, a tension member, said tension mem-

ber radially mounted in said plunger head, said tension member including a coil spring and tension ball whereby said plunger



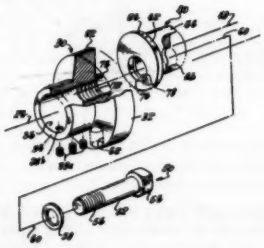
head will releasably engage an inner embroidery frame for pressing into an outer embroidery frame.

4,538,336

METHOD OF PROVIDING INFINITELY ADJUSTABLE ECCENTRIC MOTION FROM A ROTARY MOTION

Michael Oliver, P.O. Box 485, Carson City, Nev. 89701

Filed Dec. 9, 1982, Ser. No. 448,300
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—426.6 **2 Claims**



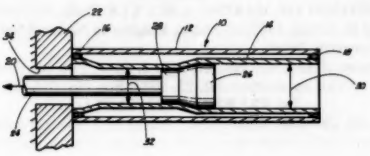
1. The method of providing an adjustable eccentric motion from a rotary motion comprising: affixing a mounting member to rotary output means; locating an off-center threaded opening in said mounting member; providing axially extending tapered tubular connecting portions between said mounting member and a cylindrical member having an off-center opening there through; fastening the cylindrical member to the said mounting member by means of threaded fastening means extending through said opening in said cylindrical member and said connecting portions threaded into the said threaded opening, wherein the said tapered connecting portions locked in position as said fastening means is tightened; providing a bearing means on said cylindrical member; connecting said bearing means to a work output means; activating the rotary output means thus giving an eccentric motion to the cylindrical motion; deactivating the rotary output means; loosening the said threaded fastening means; turning the said cylindrical member to a new position relative to the mounting member; fastening the cylindrical member to said output member by means of the threaded fastening means as before; and reactivating the rotary output means thus giving a different eccentric motion to the cylindrical member than was originally given to it.

4,538,337

METHOD OF MECHANICALLY PRESTRESSING A TUBULAR APPARATUS

Richard L. Holbrook, Louisville, and Dean L. Mayer, Alliance, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation-in-part of Ser. No. 413,284, Aug. 31, 1982, Pat. No. 4,470,188. This application Jun. 27, 1984, Ser. No. 624,891
Int. Cl.³ B23P *9/00*
U.S. Cl. 29—445 **4 Claims**



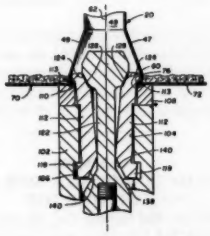
1. A method of prestressing a tubular apparatus having at least one metal inner tube positioned within and spaced apart from a metal outer tube, the method comprises connecting the inner tube to the outer tube at at least two locations spaced along the length of the tubular apparatus with the walls of the inner and outer tubes spaced from each other, and then, which the tubes are connected, expanding increasing the diameter of at least a major portion of the inner tube between said locations so as to permanently shorten the inner tube whereby a tensile prestress is applied to the inner tube and a compressive prestress is applied to the outer tube with the inner and outer tubes remaining spaced from each other.

4,538,338

METHOD FOR MANUFACTURING A FURNACE HEAT EXCHANGER AND PLATE ASSEMBLY

Russell W. Hoeffken, Belleville, and John M. Wiese, Red Bud, both of Ill., assignors to Snyder General Corporation, Red Bud, Ill.

Filed May 2, 1983, Ser. No. 490,729
Int. Cl.³ B21D *39/00, 53/02;* B23P *15/26*
U.S. Cl. 29—509 **10 Claims**



1. A method of securing a heat exchanger unit for a furnace to a plate member, comprising the steps of:

providing said heat exchanger unit as a relatively thin walled sheet metal structure defining a chamber for the flow of fluid to be in heat exchange relationship with the walls of said heat exchanger unit, said heat exchanger unit having at least one opening into said chamber through a wall of said heat exchanger unit and defined by a peripheral rim;

providing a plate member including an opening corresponding to said opening in said heat exchanger unit and defined by a seamless perimeter flange projecting from the plane of said plate member;

inserting said flange into said chamber through said opening in said heat exchanger unit; and

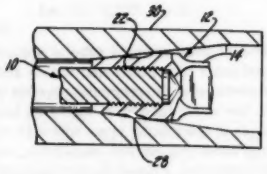
bending said flange radially outwardly with respect to a central axis of said opening and axially with respect to said axis into engagement with an inner wall surface of said heat exchanger unit at the periphery of said opening and substantially without displacement of said rim to form a substantially rigid leakproof joint between said heat exchanger unit and said plate member.

4,538,339

METHOD OF MAKING A SUCKER ROD ASSEMBLY

Peter D. Ewing, Milford, Mich., assignor to National Set Screw, Plymouth, Mich.

Division of Ser. No. 298,565, Sep. 2, 1981, Pat. No. 4,406,561.
This application Jul. 22, 1983, Ser. No. 516,452
Int. Cl.³ B21D *39/00*; B23P *11/00*
U.S. Cl. 29—510 **2 Claims**



1. A method of connecting a uniform diameter steel rod-end fitting to a steel rod in a sucker rod assembly,

said rod-end fitting comprising a unitary body including a tool receiving shank with a first connector portion at one end and a second connector portion at the other end, said method comprising the steps of:

forming said first connector portion with a uniform diameter cylindrical socket having a bottom and a uniform diameter threaded portion adjacent the bottom of said socket and an unthreaded portion adjacent the outer end of said socket,

roll-forming threads on an end of said rod with the major diameter of the uniform diameter threads being greater than the diameter of the rod,

screwing the threads on the rod into the threads in the socket with the threads on the end of said rod terminating adjacent the inner end of said unthreaded portion of said socket,

and extruding said unthreaded portion of said first connector portion against said rod so that the unthreaded surface of said socket is disposed in engagement with the unthreaded surface of said rod, and said rod and rod-end are mechanically interlocked and sealed in close fitting engagement.

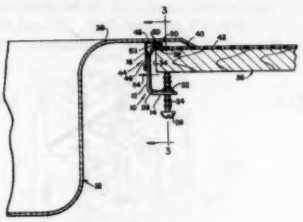
4,538,340

METHOD OF CLAMPING A SINK BOWL TO A COUNTER TOP

James Ricke, 38 W. 594 Hilltop Dr., St. Charles, Ill. 60174

Filed Jun. 30, 1983, Ser. No. 509,424
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—526 R **1 Claim**

1. A method of mounting a flanged sink bowl in an opening in a counter top comprising attaching an angle-iron molding strip to the lower surface of said sink bowl flange, the portion of said molding attached to said lower surface having an inwardly directed marginal groove, placing said sink bowl in said opening in the counter top with flange and said portion of the strip attached thereto in engagement with the surface of said counter top proximate the opening and the other portion of said molding disposed within said opening, and holding said sink bowl in said opening by means of at least one clamp clip having a hooking end engaging said groove and a threaded fastener with an end engaged with the bottom surface of said counter top proximate said opening and arranged such that upon tightening of said threaded member said clamp clip engages and urges said other portion of said strip in a direction springingly urging the edge of said first portion and said sink bowl flange towards the top surface of said counter top.

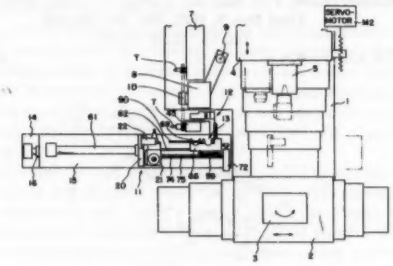


4,538,341

MACHINE TOOL WITH TOOL CHANGE FUNCTION

Yoshio Doi, Kariya; Tetsuro Yamakage; Kunimichi Nakashima, both of Anjoh, and Akihiro Matsuura, Chiryu, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 22, 1983, Ser. No. 477,990
Claims priority, application Japan, Mar. 29, 1982, 57-49040
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **10 Claims**



1. A machine tool with a tool change function, comprising:

a tool magazine for removably storing a plurality of tools;

a spindle head for rotatably carrying a horizontal tool spindle and having a tool receiving hole for removably receiving said tools one at a time;

a tool changer provided between said tool magazine and said horizontal tool spindle of said spindle head for transferring said tools therefrom;

a single vertical head rotatably supporting a vertical tool spindle and a horizontal drive shaft drivingly connected with said vertical tool spindle and adapted to be removably mounted on said spindle head, said horizontal drive shaft being drivingly connected with said horizontal tool spindle and said vertical tool spindle also having a tool receiving hole for removably receiving said tools one at a time;

a vertical head support for removably supporting said vertical head, said spindle head and said vertical head support being relatively movable in a vertical direction and first and second horizontal directions perpendicular to each other;

first and second feed means for effecting relative movement between said spindle head and said vertical head support respectively in said vertical direction and said first horizontal direction so as to bring said horizontal drive shaft of said vertical head into axial alignment with said horizontal tool spindle;

third feed means for effecting relative movement between said spindle head and said vertical head support in said second horizontal direction so as to mount said vertical head on said spindle head, said horizontal drive shaft being drivingly connected with said horizontal tool spindle;

a tool support station for vertically supporting said tools at least one at a time so as to enable said vertical tool spindle of said vertical head being mounted on said spindle head to receive and remove any one of said tools from said tool support station; and

a tool transfer device provided between said tool changer and said tool support station for transferring said tools therebetween such that each tool transferred from said tool changer to said tool support station is vertically held at said tool support station for subsequent insertion into said vertical tool spindle of said vertical head.

4,538,342

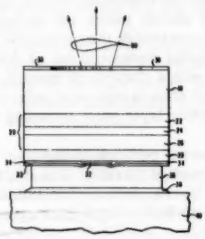
FORMING PLATINUM CONTACTS TO IN-BASED GROUP III-V COMPOUND DEVICES

Irfan Camlibel, Stirling; Aland K. Chin, Berkeley Heights; Brymer H. Chin, North Plainfield, and Christie L. Zipfel, Summit, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 15, 1984, Ser. No. 621,082

Int. Cl.³ H01L *21/285*

U.S. Cl. 29—569 L **11 Claims**



1. A method of fabricating a device, which includes forming a low specific-contact resistance electrical contact on a layer of an In-based, Group III–V compound semiconductor, comprising the steps of:

(a) depositing a thin layer of essentially only Pt on said In-based layer, and

(b) sintering said layers at a temperature of about 450°–525° C. for a time of about 5–30 minutes in a reducing ambient.

4,538,343

CHANNEL STOP ISOLATION TECHNOLOGY UTILIZING TWO-STEP ETCHING AND SELECTIVE OXIDATION WITH SIDEWALL MASKING

Gordon P. Pollack, Richardson; Clarence Teng, Plano, and William R. Hunter, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 15, 1984, Ser. No. 620,995

Int. Cl.³ H01L *21/31, 21/76*

U.S. Cl. 29—576 W **13 Claims**

1. A method for fabrication of integrated circuits, comprising the steps of:

providing a monocrystalline silicon substrate;

covering predetermined portions of said substrate with a first patterned silicon nitride layer;

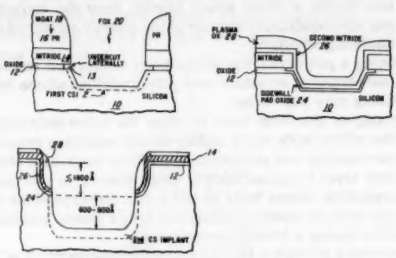
anisotropically etching a recess in said substrate where not covered by said first patterned silicon nitride layer;

depositing a sidewall masking layer to cover sidewalls of said recess;

anisotropically etching sidewall masking layer to substantially clear the bottom of said recess;

etching said substrate again, to make said recess deeper;

oxidizing exposed portions of silicon to form isolation oxide in said recess;



removing said first silicon nitride layer; and

forming desired active devices in portions of said substrate formerly covered by said first silicon nitride layer.

4,538,344

METHOD OF FORMING ELECTRODE/WIRING LAYER

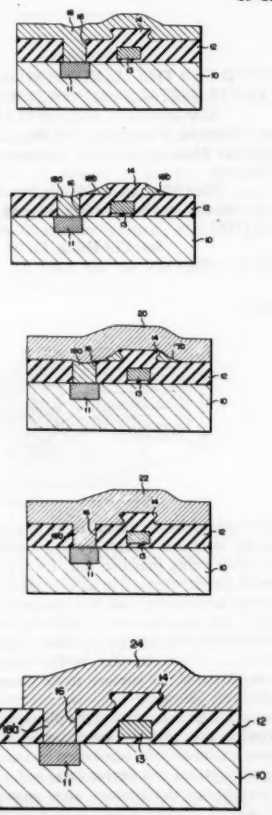
Katsuya Okumura, Yokohama, and Masaaki Ueda, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 21, 1984, Ser. No. 582,223

Claims priority, application Japan, Feb. 22, 1983, 58-28097

Int. Cl.³ H01L *21/24, 29/46, 21/28*

U.S. Cl. 29—589 **15 Claims**



1. A method of forming an interconnection structure, includ-

ing an electrode/wiring layer, on a semiconductor substrate, comprising the steps of:

forming on the semiconductor substrate an insulating structure having a recess which extends from the surface of said semiconductor substrate to the exterior surface of said insulating structure;

forming a polycrystalline silicon body within said recess of said insulating structure, said polycrystalline silicon body filling only said recess;

forming an aluminum layer to cover the entire polycrystalline silicon body and a surface of said insulating structure surrounding said polycrystalline silicon body, said aluminum layer being sufficiently large relative to said polycrystalline silicon body to allow said polycrystalline silicon body to convert completely into a silicon aluminum alloy during a heating process; and

converting through a heating process substantially all of the polycrystalline silicon in said polycrystalline silicon body and the aluminum in the portion of said aluminum layer adjacent to said polycrystalline silicon body into an alloy of aluminum and silicon to form an electrode/wiring layer establishing a good electrical contact with the semi-conductor substrate, the electrode/wiring layer comprising the alloy formed in said recess and the remaining portion of said aluminum layer.

4,538,345

METHOD FOR THE MANUFACTURE OF A PACK OF COATED METAL LAMINAS FOR ELECTRICAL MACHINERY AND APPLIANCES

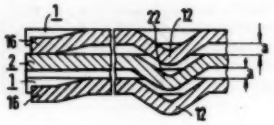
Arthur Diederichs, Wuerzburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 591,308

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311852

Int. Cl.³ H02K *15/02*

U.S. Cl. 29—596 **8 Claims**



1. In a method for the manufacture of a pack of coated metal laminas for electrical machinery and appliances in which the laminas, after being punched out, are arranged at a distance from one another, exposed in an annealing furnace to a reducing gaseous atmosphere and then assembled in the final plate-pack form, the improvement comprising the steps of:

(a) punching or stamping projections and depressions, corresponding to one another, in the laminas for the mutual connection of the laminas to be assembled into a plate-pack;

(b) assembling the laminas of the plate-pack by an initial axial pressing step, prior to annealing, into a unit with an ensured minimum axial separation by means of the interlocking projections and depressions; and

(c) assemblying the laminas, after annealing into the final plate-pack form by a final axial pressing step.

4,538,346

METHOD FOR MANUFACTURE OF SELECTIVELY COATED CARRIER PLATE

William D. Street, Sahuarita, Ariz., assignor to SFE Technologies, Inc., San Fernando, Calif.

Continuation of Ser. No. 301,648, Sep. 14, 1981, abandoned. This application May 29, 1984, Ser. No. 614,720

Int. Cl.³ H01F *41/00*

U.S. Cl. 29—602 R **11 Claims**

1. A method for selectively coating with an electrical conductor a plurality of insulative carrier plates, each having a pair of flat mounting faces and a plurality of edge faces between the mounting faces, the edge faces including a plurality of spaced-apart, flat, coplanar protrusions projecting from remaining portions of the edge faces, the method comprising the steps of:

forming a plurality of side-by-side rows of openings in a single large insulative carrier plate assembly;

separating the single carrier plate assembly along straight lines through the respective rows of openings to form the plurality of carrier plates, the surfaces formed by the separations comprising the protrusions;

selectively coating portions of one of the mounting faces of each plate with a plurality of mutually isolated first conductive layer areas in regions adjacent the protrusions, the first conductive layer areas extending to respective protrusions;

selectively coating portions of the other mounting face of each plate with a plurality of mutually isolated second conductive layer areas in regions adjacent the protrusions, the second conductive layer areas extending to respective protrusions;

stacking the plates mounting face-to-mounting face so respective protrusions of adjacent plates adjoin; and

applying a conductive layer to the end faces of the adjoining protrusions of the stacked plates to the exclusion of remaining portions of the edge faces intermediate the protrusions so as to interconnect electrically respective first and second conductive layer areas associated with each protrusion.

4,538,347

METHOD FOR MAKING A VARISTOR PACKAGE

Frank C. Palilla, Framingham, Mass.; Burton W. MacAllister, Jr., Hudson, N.H., and Caster Salemi, Medfield, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 18, 1984, Ser. No. 621,353

Int. Cl.³ H01C *7/12, 17/30*

U.S. Cl. 29—619 **2 Claims**

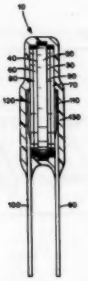
1. A method of making an encapsulated varistor package comprising the steps:

Step 1—pressing a varistor powder mixture to form a pressed body, said pressed body having a first and a second side;

Step 2—heating the product from step 1 to a range of about 1400° C. to about 1500° C. at about 5° C./min to about 18° C./min;

Step 3—maintaining the product of step 2 at about 1400° C. to about 1500° C. for about one to about 4 hours;

Step 4—cooling the product of step 3 at less than 4° C./min to room temperature;
Step 5—acid etching the product from step 4;
Step 6—coating the product from step 5 with a fritted-silver suspension on selected areas on said first and second sides;
Step 7—heating the product from step 6 to a range of about 540° C. to about 820° C. at about 5° C./min to about 10° C./min;



Step 8—maintaining the product of step 7 at about 540° C. to about 820° C. for up to 20 minutes;
Step 9—cooling the product of step 8 at less than 4° C./min to room temperature;
Step 10—soldering electrical leads on said first side and on said second side of the product of step 9; and
Step 11—encapsulating the product of step 10 with a resilient epoxy resin to form an encapsulated varistor package.

4,538,348

MOLTEN CARBONATE FUEL CELL MATRIX TAPE AND ASSEMBLY METHOD

Raymond W. Vine, Avon; Craig R. Schroll, West Hartford, and Carl A. Reiser, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 307,123, Sep. 30, 1981,. This application Nov. 7, 1983, Ser. No. 549,020
Int. Cl.³ H01M *8/14*
U.S. Cl. 29—623.1 **7 Claims**

1. In the process of assembling a molten carbonate fuel cell including forming a fuel cell stack by stacking a plurality of electrodes separated by layers of matrix material, wherein the improvement comprises: inserting as the matrix material a matrix comprising particles inert to molten carbonate electrolyte having a particle size less than about one micron, ceramic particles having a particle size greater than about 25 microns, and an organic polymer binder material, the binder material being present in an amount of at least about 35% by volume, the matrix material being flexible, pliable, and compliant at room temperature, into the fuel cell stack, and utilizing as the fuel cell anode, an anode with sufficient porosity to contain sufficient electrolyte for continuous operation of the molten carbonate fuel cell for at least 40,000 hours.

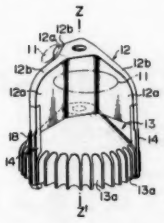
4,538,349

COIL FITTING SYSTEM

Kenichi Nakamura, Yachiyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,391
Claims priority, application Japan, Aug. 13, 1982, 57-139721; Feb. 10, 1983, 58-19690
Int. Cl.³ H02K *15/085*
U.S. Cl. 29—736 **13 Claims**

1. A coil fitting system for force fitting a plurality of coils in slots of an iron core of an electric rotary machine, comprising:
a pressing number for pressing and force fitting the coils in said slots, said pressing member being formed with a multiplicity of grooves at its outer peripheral edge portion for slidably receiving blades for holding the coils to be pressed, said pressing member further comprising:
a first pressing surface for supporting a coil end portion of at least one coil; and



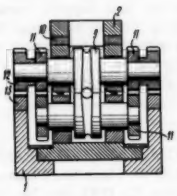
a second pressing surface, in spaced-apart relation to said first pressing surface in a coil pressing direction, for supporting a coil end portion of another coil arranged in such a manner that a portion thereof overlaps a portion of the coil end portion supported on said first pressing surface,
a portion of said first pressing surface extending into a region located at least on an extension in the coil pressing direction of said grooves located on said edge portion.

4,538,350

METHOD OF MANUFACTURING A MULTICORE CABLE

Vsevolod V. Nosal, Leningradsky prospekt, 74, kv. 205; Jury V. Rybakov, ulitsa Goncharova, 7, kv. 58; Viktor T. Golovkin, Zelenodolskaya ulitsa, 28, korpus 3, kv. 51; Mikhail M. Novokreschenov, ulitsa Lobachevskogo, 78, kv. 47; Boris V. Lysikov, Universitetsky prospekt, 21, korpus 1, kv. 8, and Anatoly V. Staneshin, Ryazansky prospekt, 97, kv. 44, all of, Moscow, U.S.S.R.

Filed Jun. 24, 1982, Ser. No. 391,300
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—825 **5 Claims**



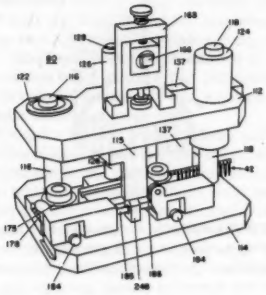
1. A method of manufacturing a multicore cable with insulation, particularly for sensing elements of communication lines, comprising the steps of:
assembling a blank of a cable;
deforming said blank of a cable from a diameter of about 18.0 mm to a diameter of about 3.0 mm in two successive reductions by
rolling said blank between two rolls of varying profile over the perimeters thereof to smoothly vary the degree of reduction over the length of the working stroke from 0 to 90 percent, and
rotating said blank prior to each successive reduction at an angle up to 90° relative to the preceding reduction; and
annealing said blank of a cable following each reduction.

4,538,351

CONTACT INSERTION HEAD AND METHOD OF INSERTING CONTACTS

Willard E. Rapp, Franklin Township, Somerset County, N.J., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 26, 1983, Ser. No. 535,972
Int. Cl.³ H01R 9/24; B23P 19/04
U.S. Cl. 29—845 **6 Claims**



1. A method of inserting an electrical contact, having a body portion and a pair of opposed tines depending therefrom, into a connector cavity having opposed ribs therein, the method comprising the steps of:

(a) aligning the contact with the connector cavity;

(b) inserting a punch into the body portion of the contact to spread the tines apart; and

(c) urging the contact into the cavity to cause the previously spread tines to straddle the opposed ribs.

2. The method as set forth in claim 1, characterized by:

repeating steps (a) and (c) for a predetermined array of cavities in the connector.

5. An apparatus for inserting electrical contacts, each having a body portion and a pair of opposed tines depending therefrom, into a cavity in a connector housing, said cavity having opposed ribs therein, the apparatus comprising:

a support means;

a punch mounted on said support means;

means, mounted on said support means, for axially positioning a contact between and in axial alignment with the punch and the cavity of a connector; and

means, mounted on said support means, proximate said punch, for urging the punch through the body portion of the contact to spread the tines apart, and to further urge the contact into the cavity to position the contact therein with the tines straddling the ribs.

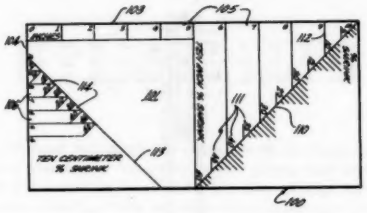
4,538,352

SHRINKAGE COMPENSATED MEASURING DEVICE

Donald E. Frith, 1109 W. Clark St., Champaign, Ill. 61820

Filed Nov. 22, 1983, Ser. No. 554,204
Int. Cl.³ G01B 3/04
U.S. Cl. 33—1 B **6 Claims**

1. A shrinkage device comprising a flat body member, a first scale on the flat body member calibrated in units indicative of length, the scale including an initial point and a reference point spaced from the initial point and each point on the first scale indicative of the distance from that point to the initial point, a second scale on the flat body member calibrated in units indicative of percent shrinkage, each point on the second scale corresponding to a unique point on the first scale wherein a line passing through a point on the first scale and the corresponding point on the second scale is parallel to a line passing through any other point on the first scale and the corresponding point on the second scale, the second scale including a reference point which corresponds to the reference point on the first scale, the distance between the reference point on the second scale and a second point on the second scale being indicative of the percent difference between the distance indicated by the reference point on the first scale and the distance indicated by the point on the first scale to which the second point on the second scale corresponds, a first array of lines on the flat body member, each line of the first array corresponding to a unique percent shrinkage, and a second array of lines on the flat body member intersecting the first array of lines, the distance between two successive lines of the second array as measured along any one line of the first array being inversely proportional to one minus the percent shrinkage corresponding to that one line of the first array divided by one hundred, whereby the percent shrinkage determined from the first and second scales may be compensated for by the distance between successive lines of the second array as measured along the line of the first array corresponding to that percent shrinkage.

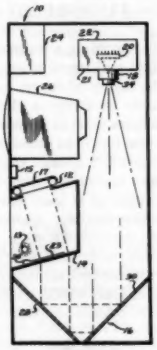


4,538,353

ELECTRONIC FOOT MEASURING APPARATUS AND METHOD

F. Philip Gardner, McHenry, Ill., assignor to Interco, Incorporated, St. Louis, Mo.

Filed Dec. 21, 1984, Ser. No. 685,137
Int. Cl.³ A43D 1/00
U.S. Cl. 33—3 C **14 Claims**



1. Apparatus for electronic measurement of a foot comprising an enclosure,

panel means disposed within said enclosure for at times receiving placement thereon of a foot,

light source means disposed within said enclosure for projecting light rays upon said panel means, said light rays being effective when a foot is placed upon said panel means to define thereon a shadow outline of said foot,

sensing means for viewing said foot shadow outline to receive light energy therefrom and transduce it into an

electronic foot image having distinct light/dark status, and

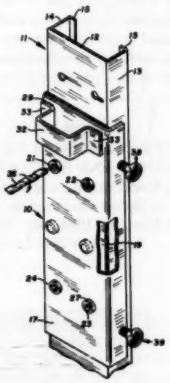
microcomputer means for receiving said electronic foot image, said microcomputer means being effective to resolve said electronic image into a precisely defined, dimensionally accurate measurement of the foot and determine a specific shoe size that fits properly the measured foot.

4,538,354

MAGNETIC TEMPLATE

Robert A. Smolik, 670 W. Seventh St., St. Paul, Minn. 55102

Filed Sep. 13, 1983, Ser. No. 531,672
Int. Cl.³ G01B 3/14
U.S. Cl. 408—72 B **11 Claims**



1. A template assembly useable with respect to the formation of a hole pattern in a magnetically attractive surface, comprising:

a ferromagnetic metal wall stud having a major side member and a perpendicular end member;

a generally flat rectangular, rigid base comprised of ferromagnetic material and having a width substantially equal to the width of the major side member of the metal wall stud;

a flexible magnetized pad magnetically adhered on a first side to a side of the base and substantially coextensive with the side of the base, said pad having a second side facing away from the base, said first side of the pad having a greater magnetic flux than the second side, said second side releasably, magnetically adhered to the metal wall stud prepatory to the formation of a hole pattern, said pad having a generally rectangular shape with a width substantially equal to that of the base;

template openings in the base describing a mounting hole pattern;

openings in the magnetized pad corresponding in location to the template openings in the base for access through the template openings for the formation of a hole pattern in the major side member of the stud; and

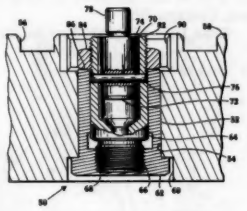
a right angle flange extended from an edge of the base on the side carrying the magnetized pad positioned to abut the end member of a metal wall stud and properly orientate the template opening of the base with respect to the major side member.

4,538,355

REMOVABLE AND REPLACEABLE INDEXING AND LOCATING TOOLING COMPONENT

Manfred Morghen, San Diego, Calif., assignor to General Dynamics Corporation/Convair Div., San Diego, Calif.

Filed Dec. 23, 1983, Ser. No. 565,247
Int. Cl.³ G01B 5/25
U.S. Cl. 33—180 R **9 Claims**



1. An indexing and locating component adapted to be used with a sub-plate for precision machining of parts and comprising:

a generally tubular bushing having a longitudinally extending predetermined bore that is provided with a threaded portion, the external diameter of the bushing being sized so as to be capable of being received within a predetermined bore in the sub-plate;

a locator means replaceably positioned within the bushing and adapted to extend above the upper surface of the sub-plate for indexing and locating a production part that is positioned on the sub-plate for machining; and

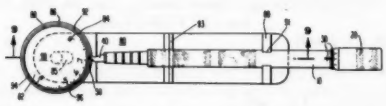
a removable locking means cooperating with the bushing and the locator means to lock the locator means in a predetermined vertical and rotational position.

4,538,356

SURGICAL KNIFE WITH CONTROLLABLY EXTENDABLE BLADE AND GAUGE THEREFOR

William R. Knepshield; David D. Ogletree, both of Malvern, and Nat Sander, Broomall, all of Pa., assignors to KOI Associates, Inc., Frazer, Pa.

Division of Ser. No. 410,476, Aug. 23, 1982, Pat. No. 4,499,898. This application Nov. 29, 1984, Ser. No. 676,316
Int. Cl.³ B27G 23/00
U.S. Cl. 33—185 R **4 Claims**



1. Gauge for measuring the projection of a blade-like flat member from an elongated body associated therewith, said body having an axis along which said flat member projects and a front surface from which said member projects a distance to be measured, said gauge including a flat desk-like gauge indicator and a means for retaining said body in a fixed position with said flat member lying with a flat side thereof projecting over said gauge indicator, said gauge indicator having a cylindrical side surface, said front surface of said body abutting said side surface of said disk indicator when said body is retained in said fixed position, said gauge indicator further comprising a circular disk member, rotatable about the center point thereof, at least a portion of the edge of said member defining at least a portion of a first circle, and at least a portion of a second circle scribed on said disk member inward from said first circle and eccentric thereto, said circle portions defining at least a portion

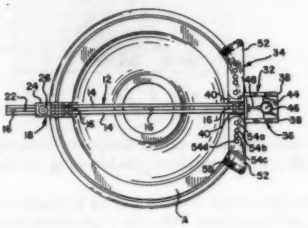
of a circumferential common shape of varying radial width, further including markings indicative of the radial distance between said circle portions at a multiplicity of circumferential points thereon.

4,538,357

RAILWAY WHEEL ROTUNDITY GAGE

William G. Dressel, Elk Grove Village, and William J. Kucera, Elmhurst, both of Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Dec. 15, 1983, Ser. No. 561,568
Int. Cl.³ G01B 5/255
U.S. Cl. 33—203.18 **3 Claims**



1. A rotundity gage for measuring the roundness of the outer tread of a railway wheel, said gage comprising

a main cross bar for extending diametrically across the diameter of the railway wheel, and adapted to be rotated across a face of the wheel,

a roller means mounted for lengthwise adjustment on said cross bar for engaging the wheel tread,

a pair of angularly spaced roller means mounted on the other end of said cross bar and engageable with the wheel tread in opposition to said adjustable roller means,

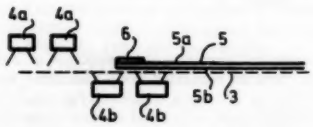
a dial indicator means having a plunger mounted on said main cross bar and having a plunger engageable with the wheel tread between said angular spaced roller means for indicating the out-of-roundness of the wheel tread when said main cross bar is rotated.

4,538,358

DRYING PLANT FOR DRYING PRINTED MATERIAL

Sylve J. D. Ericsson, Tumba, Sweden, assignor to Svecia Silkscreen Maskiner AB, Norsborg, Sweden

Filed Dec. 5, 1983, Ser. No. 557,935
Claims priority, application Sweden, Dec. 16, 1982, 8207200
Int. Cl.³ F26B 23/04
U.S. Cl. 34—4 **8 Claims**



1. A drying plant for drying printing substance applied to a first surface of a radiation transmissive substrate, said drying plant comprising:

means for conveying said material along a path;

means for irradiating an opposite surface of said substrate from said first surface as said substrate is conveyed along a first portion of said path so to cure a first layer of the printing substance adjacent said first surface of the material;

means for irradiating said first surface as said substrate is conveyed along a subsequent portion of said path so to cure the remaining layer of said printing substance.

4,538,359

METHOD OF DRYING LONG-DISTANCE PIPELINES IN SECTIONS

Harald Steinhaus, Datteln, and Detlef Meiners, Wietmarschen, both of Fed. Rep. of Germany, assignors to Kopp GmbH International Pipeline Services, Lingen, Fed. Rep. of Germany

Filed Jun. 7, 1984, Ser. No. 618,098
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3320512
Int. Cl.³ F26B 3/06
U.S. Cl. 34—21 **12 Claims**

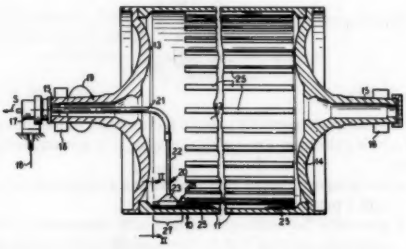
1. A method of drying long-distance pipelines for conveying fluids comprising the steps of evacuating a section of the pipeline by utilizing vacuum pump disposed at an end of said pipeline section, introducing a scavenging gas into the opposite end of said pipeline section, maintaining said evacuating step during said step of introducing scavenging gas, and controlling the flow rate of said scavenging gas so that the scavenging gas flows into said pipeline section at a molar flow rate which at least initially is equal to or less than the molar flow rate of the evacuating stream such as to preclude precipitation of moisture on the inner walls of said pipeline section.

4,538,360

STEAM HEATED DRYER DRUM HAVING STATIONARY SIPHON AND SPOILER BARS

James L. Chance, Rockton, Ill., and Gregory L. Wedel, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Mar. 26, 1984, Ser. No. 593,258
Int. Cl.³ F26B 13/18
U.S. Cl. 34—41 **21 Claims**



1. In combination in a steam heated hollow dryer drum having means for mounting it for rotation with its perimeter in contact with a web to be dried, the drum defining a steam chamber within a shell having a thin cylindrical heat transfer wall and opposite end closures, means for introducing steam into the chamber, a stationary siphon within the chamber and having a downwardly extending intake head aligned in spaced relation over an annular relatively narrow area of an inner surface of said wall adjacent to one of said end closures, and which narrow area rotates past said intake head which draws off the condensate except for a layer of a thickness about equal to said spaced relation and extending from the offrunning side of the head so that rimming of the condensate layer is liable to occur in said area, and comprising means for attaining efficiently uniform heat transfer through said wall, including:

spoiler bars extending longitudinally on a major area of said inner surface of said wall between said narrow area and the opposite end closure for effecting turbulence of condensate to improve heat transfer through said major area in the rotation of the drum;

and turbulence promoting means carried by said offrunning

side of said intake head and projecting from said head across the space between said head and the surface of said narrow annular area and into the condensate layer on said narrow area surface, for effecting turbulence of the condensate layer and thereby preventing rimming and attaining improved heat transfer through said narrow area surface during the rotation of said narrow area past said intake head.

4,538,361

APPARATUS FOR THE TREATMENT OF CONTINUOUSLY TRANSPORTED LENGTHS OF TEXTILE MATERIAL WITH CIRCULATING AIR, ESPECIALLY A TENTERING FRAME DRYER

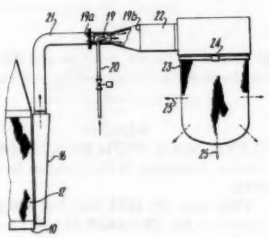
Harry Gresens, Benningen, Fed. Rep. of Germany, assignor to Bruckner Trockentechnik GmbH & Co. KG, Leonberg, Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 575,868

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1983, 8304087[U]

Int. Cl.³ F26B *13/02*

U.S. Cl. 34—82 **13 Claims**



1. Apparatus for the air treatment of textile material comprising a housing; means for moving a length of material continuously through said housing; an air blower in said housing for moving air through the textile material and thereby entraining fibers from said textile material; a rotary drum in said housing downstream of the textile material; duct means communicating between said blower and said drum for establishing in said housing a circulating air stream therebetween; a fibre filter carried by said drum for rotation therewith; means rotatably mounting said drum in such position that said air stream passes through said fibre filter, thereby enabling fibres to collect on a surface of said fibre filter; a cleaning nozzle in close proximity to said surface of said fibre filter and extending axially over the length thereof; an air filter in said housing; a conduit coupling said nozzle to said air filter; ejector means accommodated in said conduit between said nozzle and said air filter for establishing a flow of air from said nozzle toward said air filter; and means coupling said ejector means to a source of pressure fluid, whereby said nozzle is operable to remove fibres from said fibre filter surface and deposit them on said air filter.

4,538,362

HAIR DRYER AND CONCENTRATOR WITH RELEASABLE CONNECTING MEANS

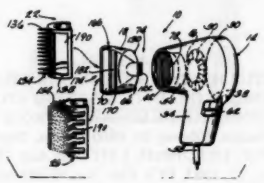
Matthew L. Andis, Racine, Wis., assignor to Andis Company, Racine, Wis.

Filed Oct. 31, 1983, Ser. No. 546,839

Int. Cl.³ A45D *20/12*

U.S. Cl. 34—97 **17 Claims**

1. A hair drying assembly comprising a hair dryer including a housing defining a straight line air pathway therethrough and including a circular air outlet, and an elongated handle connected to said housing, a hollow concentrator including an elongated outlet and a circular inlet, means for releasably connecting said concentrator to said dryer housing so that said concentrator circular inlet is aligned with said hair dryer circular outlet and so that said concentrator elongated outlet is parallel to said handle, said connecting means comprising projection means on said hair dryer housing and projection engaging means on said concentrator for releasably holding said projection means when said concentrator circular inlet is adjacent said hair dryer circular outlet and said concentrator is rotated in one direction relative to said hair dryer, and for



releasing said projection means when said concentrator is rotated in an opposite direction relative to said hair dryer, grooming means including an attachment portion comprising a pair of parallel spaced apart rails, and means for releasably attaching said grooming means to said concentrator elongated outlet comprising parallel spaced apart outwardly open indentations on said concentrator, which indentations receive said attachment portion rails.

4,538,363

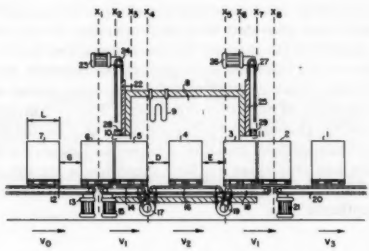
SHRINK OVEN

Dimiter S. Zagoroff, 10 Hilliard Pl., Cambridge, Mass. 02138

Continuation-in-part of Ser. No. 575,888, Feb. 1, 1984,. This application May 9, 1984, Ser. No. 608,431

Int. Cl.³ F26B *15/16*

U.S. Cl. 34—225 **7 Claims**



1. A shrink oven for heating and shrinking plastic film disposed about loads, said oven having an exit opening for exit of a first load, said oven characterized in having movable means to move a second load through an entry opening into said oven, synchronizing means for causing said movable means to move in a manner dependently with exit movement of said first load to displace heated oven air to fill the air space left behind said first load as it exits the oven, thereby to limit inward flow of cool air during exit of the load, means to stack an entering or exiting load closely adjacent to another load to limit flow of heated air at the outer end of said load as it enters or exits said oven, and means to maintain spacing of a load from adjacent loads while said load is resident in said oven to expose the end of said load to heat, there being first and second conveyors at the entrance and exit openings, respectively, of said oven, operable at the same speed for supplying a fresh load while a heated load is removed, and a further conveyor within said oven operable to remove a load from said first conveyor, position said load for exposure of its ends to heat and deliver the heated load to said second conveyor,

said further conveyor driven dependently with, and at a faster speed than, said first and second conveyors, said conveyors adapted to stop in unison while a load is on said further conveyor in said oven and spaced from adjacent loads, whereby conservation of energy and improvement in the shrink cycle can be obtained.

4,538,364

APPARATUS HAVING BOTTOM AIR CHANNELS FOR AIR DRYING OF GRAIN IN A DRYING STORE AND FOR CONVEYING THE GRAIN AWAY FROM THE STORE

Anton B. Jensen, Ribevej 20, 6500 Vojens, Denmark

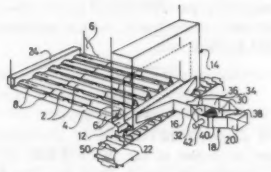
PCT No. PCT/DK82/00115, § 371 Date Aug. 25, 1983, § 102(e) Date Aug. 25, 1983, PCT Pub. No. WO83/02264, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 23, 1982, Ser. No. 530,577

Claims priority, application Denmark, Dec. 28, 1981, 5775/81

Int. Cl.³ F26B *19/00*

U.S. Cl. 34—233 **9 Claims**



1. An apparatus for air drying a granular material in a drying store and for pneumatical emptying of the store, comprising a plurality of air channels extending along a bottom surface of the store and provided with wall openings for the inlet of drying air from the channels into the material and for the outlet of the material from said store through the channels, the channels being connected with means for blowing drying air into the channels and means for providing a flow of conveying air through the channels towards a collector area for the material to be exhausted from the store, wherein said means for providing the said conveying air flow comprises a suction blower which is connected with the channels at the ends thereof facing said collector area.

4,538,365

HORIZONTAL DRIP DRYER

Martin P. Aho, P.O. Box 6333, Oakland, Calif. 94603

Filed Jul. 27, 1984, Ser. No. 635,188

Int. Cl.³ F26B *9/10*

U.S. Cl. 34—239 **11 Claims**

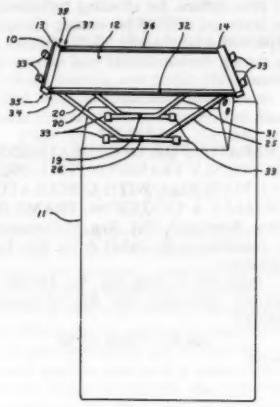
1. A dryer for drip-dry type of clothing that can be put into an in-use position and folded into a stored position, comprising:

a screen;

a first rail and a second rail; fastened to the screen on opposite sides;

a first pair of legs and a second pair of legs; each pair of legs having; one end of one leg fastened to the first rail and one end of the other leg fastened to the second rail, and the other ends of the legs of each pair acting as feet;

two pivots; each pair of legs having a pivot so that the dryer can be folded into the stored position from the in-use position, with each pivot located at a place along the length of the legs and each leg bent to make the feet wide



enough in both the in-use position and the stored position to make the dryer stable in both positions.

4,538,366

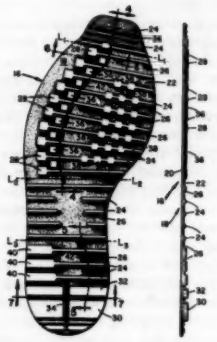
ATHLETIC SHOE WITH RIDGED OUTSOLE

Daniel E. Norton, Hampton, N.H., assignor to Nike, Inc., Beaverton, Oreg.

Filed Aug. 26, 1983, Ser. No. 526,815

Int. Cl.³ A43B *13/04*

U.S. Cl. 36—32 R **43 Claims**



1. A lightweight flexible outer sole for an athletic shoe comprising:

a base member formed of resilient material and having a heel section, an arch section, a forefoot section and a toe section, said base member having an upper surface for attachment to another member and a lower surface;

a plurality of ridges for providing traction and cushioning extending downwardly from the lower surface of said base member and transverse to the lengthwise direction thereof, said ridges being spaced from one another in the lengthwise direction of said base member and separated by spaces, each of said ridges being of uniform width;

a first lateral cleat at the lateral end of a plurality of said ridges, said lateral cleat integrally formed with said ridges; and

a second lateral cleat between adjacent ridges in said fore-

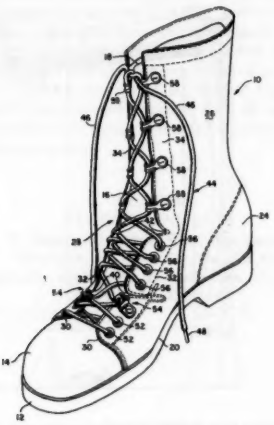
foot section, said second lateral cleats and said ridges in said forefoot section being the same depth.

4,538,367

FOOTWEAR LACING ASSEMBLY

Thomas M. Adams, San Antonio, Tex., assignor to Kaepa, Inc., San Antonio, Tex.

Filed Aug. 23, 1983, Ser. No. 525,725
Int. Cl.³ A43B *11/00*; F16G *11/04*
U.S. Cl. 36—50 **8 Claims**



1. In a lacing assembly for an article of footwear:

(a) a first vamp section including opposed vamp portions and a second vamp section, disposed upwardly adjacent of the first vamp section and including opposed vamp portions,

(b) the first vamp portions including opposed lace-receiving means at the lower end thereof and a pair of opposed transversely spaced and separate lace-receiving locking means upwardly adjacent of said lace-receiving means each separate from the other and attached to an associated vamp portion,

(c) the second vamp portions including a plurality of opposed lace receiving means, and

(d) a single continuous lace having opposed side lengths, said side lengths being received by opposed lace-receiving means and said opposed lace-receiving locking means in said first vamp portions, and said side lengths extending between said first and second vamp sections and being received by opposed lace-receiving means in said second vamp portions, said lace being received by said lace-receiving locking means in selectively lockable relation to permit the first vamp section to be adjusted and maintained in adjustement substantially independently of the second vamp section.

4,538,368

CHILD'S OVERSHOE

Bernadette Mugford, 2 Lamson Ave., Goffstown, N.H. 03045

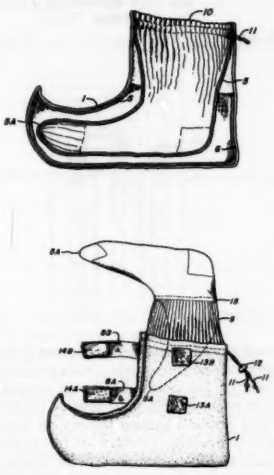
Filed Jun. 22, 1983, Ser. No. 506,717
Int. Cl.³ A43B *3/30*
U.S. Cl. 36—112 **17 Claims**

1. An overshoe comprising:

a loose-fitting outer boot for receiving the shoe of a wearer, having a sole portion, two side portions, and a foot-receiving opening, said side portions extending at least above the ankle of the wearer,

a sock-like liner of expandable fabric, one end of said sock-like liner being affixed to said outer boot at said foot-receiving opening, the other end of said sock-like liner being closed, said sock-like liner being substantially smaller in size than said outer boot, such that when the wearer's shoe is introduced, the sock-like liner stretches to fit snugly over the shoe,

said sock-like liner, when pulled out of said outer boot, being capable of receiving the wearer's shoe before placement



of the shoe into said outer boot through said foot-receiving opening, and

means for securing said overshoe snugly at said foot-receiving opening,

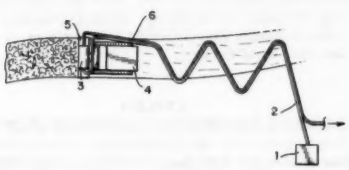
and means for securing said overshoe snugly at said ankle.

4,538,369

SNOW TRANSFER INSTALLATION

Armand Pasquier, Annecy, France, assignor to Etudes Techniques et Realisations (CdF Ingenierie) S.A., France

Filed Sep. 19, 1983, Ser. No. 533,592
Claims priority, application France, Sep. 17, 1982, 82 15687
Int. Cl.³ E01H *8/04*
U.S. Cl. 37—219 **9 Claims**



1. Snow transfer installation comprising at least one snow pickup element; an element for the production of a mixture of snow and air, said production element being operatively connected to said pickup element; the said pickup and mixture production elements being mounted on a vehicle; a duct for transportation of the snow-air mixture operatively connected to the mixture production element; and an air flow generator, said air flow generator being independent of the pickup and mixture production elements and being connected to the mixture production element by means of an air supply duct at least one portion of which is flexible.

4,538,370

WAIST EXPANDER FOR TROUSER FINISHER

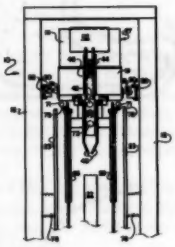
Leonard Frushtick, Denver, N.C., assignor to Leonard Automatics, Inc., Denver, N.C.

Continuation of Ser. No. 532,793, Sep. 16, 1983, Pat. No. 4,485,572. This application Aug. 31, 1984, Ser. No. 645,862

The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.

Int. Cl.³ D06F *71/28*

U.S. Cl. 38—42 **9 Claims**



1. A trouser presser comprising a frame, a stationary center buck mounted on the frame, side chests mounted on the frame on either side of the center buck and moveable between a retracted position in spaced-apart relation from the center buck and a pressing position against the center buck, with a front operator access opening forward of the center buck, and a waist expander assembly mounted on the frame and alternately moveable between a dressing position forward of the center buck and a pressing position over the center buck, said waist expander assembly comprising:

(a) a front waist buck having opposing side surfaces for receiving and engaging the front torso part of a pair of trousers;

(b) a rear waist buck having opposing side surfaces for receiving and engaging the rear torso part of a pair of trousers with the trousers encircling said front and rear waist bucks;

(c) means for alternately moving said front and rear waist bucks relatively towards and away from each other to respectively define a closed position where the trousers are held loosely around the front and rear waist bucks and an open position for holding the trousers in a tensioned condition for being pressed;

(d) the opposing side surfaces of the front and rear waist bucks being parallel to each other and in the same vertical plane to collectively define opposing, planar pressing surfaces for the opposite sides of the trousers; and

(e) the upper extent of said side chests defining planar pressing surfaces for making surface-to-surface pressing contact against said opposing side surfaces of said front and rear waist bucks.

4,538,371

MAGAZINE LOADER AND CARTRIDGE CLIP USEFUL THEREWITH

William J. Howard, P.O. Box 573, Wilson, N.C. 27893

Filed Oct. 26, 1982, Ser. No. 436,655

Int. Cl.³ F42C *27/00*

U.S. Cl. 42—87 **7 Claims**

1. A magazine loader for rapidly and easily loading cartridges held by a standard retainer strip into a firearm magazine, each of said cartridges having a neck, a base and an extractor recess, said magazine loader comprising:

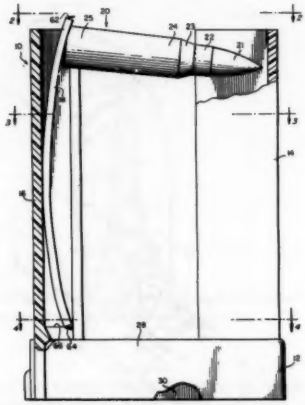
A. a skirt having an open top through which cartridges pass, an open bottom adapted to receive the magazine to be loaded, a front end, a base end opposite said front end, and two juxtaposed side walls, each of said side walls extending between the front end and the back end of the skirt; wherein the length of the open top is less than the length of the open bottom and the width of the open top is less than the width of the open bottom;

B. a cartridge-neck holder attached to the top of the skirt at its front end, said cartridge-neck holder comprising:

1. an upwardly extending front support; and

2. two laterally extending neck-arms attached to the front support at their forward ends,

wherein the laterally extending neck-arms are adapted to slidably hold the neck of a cartridge; and



C. a cartridge-base holder attached to the top of the skirt at its back end, said cartridge-base holder comprising:

1. an upwardly extending rear support; and

2. two laterally extending base arms attached to the rear support at their rearward ends,

wherein the laterally extending base arms are adapted to slidably hold the base of a cartridge; and

wherein the distance between the laterally extending base arms is greater than the width of the retainer strip which grips each cartridge by the extractor recess.

4,538,372

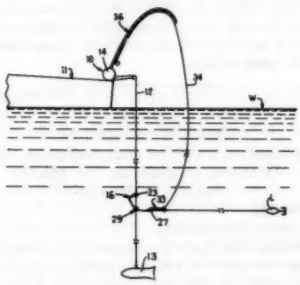
RELEASABLE DOWNRIGGER CLIP

Walter Petigoretz, 1564 Teakwood, Stevensville, Mich. 49127

Filed Oct. 5, 1983, Ser. No. 539,346

Int. Cl.³ A01K *91/00*

U.S. Cl. 43—27.4 **8 Claims**



1. A releasable downrigger clip, comprising:

a finite length of wire having

(1) a first segment thereof at a first end thereon doubled back

on itself to define an eyelet and a releasable clasp means enabling an intermediate segment of an elongated strand to be received in said eyelet by passing between said wire and said releasable clasp means;

(2) a second segment thereof at a second end thereon doubled back on itself to define a hook means;

(3) a closed loop intermediate said first and second ends, the opposite ends of said loop resiliently engaging each other but being separable against the resilient urging caused by the resilience of said wire; and

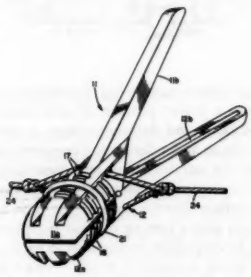
(4) said releasable clip being adapted to releasably connect to and cooperate with said elongate strand from a downrigger arrangement mounted on a boat, said strand extending from said downrigger arrangement beneath the surface of the water to a weight connected at a free end thereof, a first portion of said strand being received and held in said eyelet, a second portion of said strand being resiliently clamped between said opposite ends of said loop; and wherein said hook means is adapted to connect to a fishing line release means.

4,538,373

FISHING LINE CLIP

Bernard J. D. Rogers, 52 Hewitt Way, Booragoon, Australia

Filed Jan. 31, 1984, Ser. No. 575,445
Claims priority, application Australia, Jan. 27, 1983, PF7797
Int. Cl.³ A01K *91/00*
U.S. Cl. 43—43.12 **2 Claims**



1. A fishing line clip comprising a pair of identical members, each of said members comprising a jaw portion and a rearwardly projecting handle portion, each of said members being integrally formed with a locating peg extending transversely across a portion of the member intermediate its jaw portion and its handle portion, an adjacent slot extending transversely substantially across the remaining portion of said member formed to receive the peg of the other of said members so that when the two members are mated together with the pegs located in the corresponding slots the handle portions diverge apart and said pegs act as transverse pivot pins so that by squeezing said handle portions together said jaw portions can pivot apart, at least one elastic ring encircling the mated jaw portions to hold said jaw portions together, and rope holes in said jaw portions for enabling said clip to be fastened to an endless rope.

4,538,374

FISH LINE SINKER

Clissolde L. Louthan, 9024 NE. Oregon, Portland, Oreg. 97220

Filed Nov. 25, 1983, Ser. No. 554,890
Int. Cl.³ A01K *95/00*
U.S. Cl. 43—44.96 **3 Claims**

1. A fish line sinker comprising

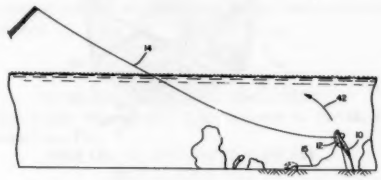
a body portion having forward and rearward ends as well as top and bottom surfaces and opposite sides,

line connecting means on said body portion adjacent a forward portion thereof,

said body portion being channel-shaped and having side wing extensions which curve outwardly and upwardly to cause said body portion to move upwardly at a relatively steep angle when a pull is imparted to said body portion by a pole line,

weight means adjacent the rearward end of said body portion,

and buoyant means adjacent the forward end of said body portion,



said weight means being of a mass to overcome said buoyant means for submerging said sinker,

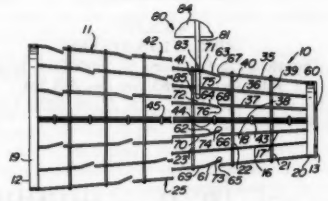
said weight and buoyant means cooperating to cause said body portion when submerged in water to position itself with the forward end upright whereby when a pull is imparted to the body portion by a pole line, the body portion in its initial movement and under the influence of said side wing extensions moves upwardly off the bottom in substantially the direction at which it is pointed to prevent snagging of the sinker on the bottom.

4,538,375

ANIMAL TRAP FOR GROUND MOLES AND THE LIKE

Albert W. Kelley, R.R. 1, Box 28, Creamridge, N.J. 08514

Filed Oct. 19, 1983, Ser. No. 543,494
Int. Cl.³ A01M *23/08*
U.S. Cl. 43—77 **6 Claims**



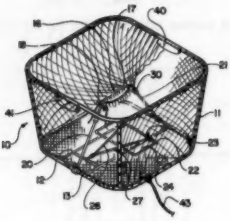
1. An animal trap for ground moles and the like, said trap comprising an elongate tubular body fabricated of reticulated wirework material and having a longitudinal internal hollow open at one body end and closed at the other body end, said hollow defining a passageway tapering continuously inwardly from said one body end to the other, and a plurality of resilient prongs carried by said body at locations spaced longitudinally of and circumferentially about said body and projecting into said passageway, said prongs being formed from the wire of said wirework material and extending obliquely into said passageway away from said one body end, for impaling an animal having entered said passageway and attempting to return out of said passageway so that the animal continues further into said tapering passageway until immobilized against further movement both laterally and longitudinally.

4,538,376

TRAP FOR MARINE ANIMALS

Roger H. Morton, 314 Sand Dune La., Holden Beach, N.C. 28462

Filed Feb. 6, 1984, Ser. No. 577,053
Int. Cl.³ A01K *69/06*
U.S. Cl. 43—100 **7 Claims**



1. A marine trap for shrimp, crabs, lobster and the like, comprising:

(a) a frame structure defining a top, bottom and a plurality of sides;

(b) a net covering said frame on its top, bottom and sides to form an enclosure;

(c) entry means, comprising said net across the top of said frame having a relatively small mouth therein for permitting entry of suitably sized marine animals;

(d) releasable tension means for biasing said net covering the top of the frame downwardly into the frame toward the bottom thereof to define an inwardly extending funnel-shaped top witn said mouth at the apex of the funnel, said funnel-shaped top cooperating with the sides and bottom of said frame to substantially prevent the marine animals from exiting the mouth while said top is under tension, and then said tension means is released and said trap inverted for emptying, said net covering the top of said frame extending outwardly in a funnel-shape from said enclosure to permit the contents to be poured from the enclosure through the mouth;

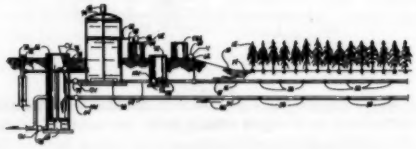
(e) bait holding means carried by the frame within the enclosure.

4,538,377

IRRIGATION SYSTEM

Ken O. Thornton, 215 E. Grimes St., Polk City, Iowa 50226

Filed Oct. 6, 1983, Ser. No. 539,704
Int. Cl.³ A01C *23/04*; A01G *25/06*; E02B *11/00*
U.S. Cl. 47—1 R **10 Claims**



1. A field crop subsurface treatment system for treatment of field crops growing on the top soil surface, comprising:

a treatment pipe submerged under the root storage tank for storing a water load to develop a hydrostatic pressure to power the discharge of materials through the treatment pipe; and

a drain pipe having a metering valve for opening and closing said drain pipe submerged beneath the treatment pipe;

said treatment pipe being connected to a water distribution source and a chemicals distribution source, each of which are operatively associated with valves which may be optionally opened to develop hydrostatic pressure to power discharged materials through the treatment pipe or closed;

said drain pipe being connected to a water storage source for storing field drained water; and

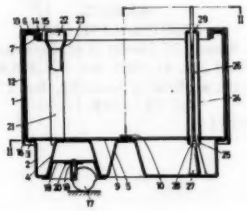
said water storage source which is in association with said drain pipe being fluidly connected to said water storage tank which is in association with said treatment pipe, whereby stored water from said drain pipe may optionally be circulated into said water storage tank and from said storage tank into said treatment pipe.

4,538,378

PLANT CONTAINER

Luis C. Roige, Lauria, 147, Barcelona, Spain

Continuation of Ser. No. 396,324, Jul. 8, 1982, abandoned. This application Jun. 5, 1984, Ser. No. 617,147
Claims priority, application Spain, Jul. 15, 1981, 259 491
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—72 **2 Claims**



1. A plant container comprising a container body, a peripheral shoulder in a lower portion of said body extending inwardly of said body and defining a base, a pair of like plates each having a shape and a dimension corresponding to approximately half of the interior shape and dimension of said body, said plates being disposed in said body for supporting plant soil on an upper surface thereof, said plates each having a width and both of said plates resting on said peripheral shoulder of said body and having edges contiguous to each other, said base comprising a water containing space beneath said plates and being provided with a plurality of peripheral raised sections having the shape of truncated cones disposed at a regular spacing generally about the periphery of said body and all having essentially equal heights to provide support for interior portions of said plates, said peripheral raised sections having deep openings on the underside thereof of a height and width to accommodate wheel supports therein, a wheel support in the form of a truncated cone inserted in at least some of said deep openings of said peripheral raised sections without any other means of attachment and a wheel fixed to said truncated cone, and a raised section in the central area of said base having a height equivalent to the peripheral raised sections of said base to provide a support for said contiguous edges of said plates, an opening defining means in said body, said opening defining means including a reentrant portion extending inwardly of said body and having a vertically downwardly extending flange on an inner edge thereof, said reentrant portion having a size approximately equal to the size of said shoulder, a stip member overyling said plate contiguous edges, a plurality of absorbant wicks on each of said plates, said wicks being spaced apart and extending along the width of said plates for a distance less than the width of said plates and being positioned so that wicks on one plate are aligned with wicks on the contiguous plate, an envelope surrounding said body, said envelope including a body portion extending adjacent to said body and having a skirting portion extending downwardly beyond said shoulder and a reentrant section located adjacent to said body reentrant portion and a flange section connected to said reentrant section to extend vertically downwardly adjacent to said body flange,

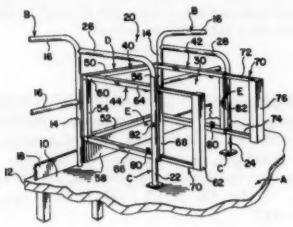
attaching means attaching said envelope flange section to said body flange, a tubular pipe for the admission of water to said water containing space having a head of cylindrical shape of a diameter greater than the diameter of said pipe, a truncated cone shaped section connecting said head to said pipe, a vertical tubular body inserted through one of said plates, a rod having a level indicator float at a lower end thereof inserted through an orifice in said vertical tubular body, said float being in the shape of a truncated cone, and a cylindrical portion of said float attached to a lower end of said rod.

4,538,379

SAFETY MEZZANINE GATE

William R. Vargo, 2101 Randall Ave., Lithonia, Ga. 30058

Filed Nov. 14, 1983, Ser. No. 550,777
Int. Cl.³ E05D *15/00*
U.S. Cl. 49—381 **13 Claims**



1. A gate assembly for an opening in a platform railing comprising:

a generally U-shaped gate member having a barrier portion for traversing said opening and side portions at each end of said barrier portion extending laterally generally in the same direction from one side thereof;

gate supporting means secured to said platform and located adjacent said side portions of said gate member; and

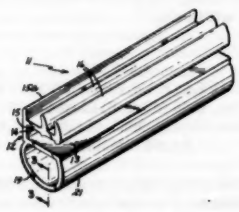
means for mounting said gate member to said gate supporting means for pivotal movement of said gate member about a horizontal axis, between a first position where said barrier portion is positioned in and traverses said opening and a second position where said barrier portion is removed from said opening.

4,538,380

LOW FRICTION WEATHER SEAL

Alan C. Colliander, Hastings, Minn., assignor to Profile Extrusions Company, Hastings, Minn.

Filed Nov. 16, 1983, Ser. No. 552,286
Int. Cl.³ E06B *7/16*
U.S. Cl. 49—475 **21 Claims**



1. A weather seal for windows, doors and the like, comprising:

an elongated base member the dimensions and material of which cause it to be at least semirigid;

a sealing member carried by the base member and extending over its length, the sealing member being formed from material that is resilient and compliant over a wide range of outside temperatures and having a predetermined coefficient of friction;

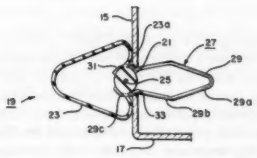
and a thin continuous film capping at least a part of the sealing member and extending over its length, the thin film being formed with a substantially uniform thickness from a material having a coefficient of friction which is less than that of the sealing member, and being sufficiently thin to permit resilient and compliant flexure with said sealing member.

4,538,381

BENDABLE OVEN DOOR GASKET

K. Stuart Vogel, Weatherford, Tex., assignor to Jamak, Inc., Weatherford, Tex.

Filed Oct. 11, 1983, Ser. No. 540,864
Int. Cl.³ E06B *7/16*
U.S. Cl. 49—479 **3 Claims**



1. In an appliance having a door and a frame with confronting surfaces, and sealing means for sealing between the two confronting surfaces, comprising in combination:

an elongate gasket member of elastomeric material, having a base for mounting to one of the confronting surfaces and a deforming section protruding outwardly from the base for sealing contact with the other of the surfaces;

a wire extending through the base parallel with the longitudinal axis of the gasket member, the wire being sufficiently ductile to be bent into a selected shape and having sufficient strength for retaining the gasket member in the selected shape; and

clip means for gripping the base and for releasably securing the base to one of the confronting surfaces, the clip means comprising a plurality of resilient clips, each having a pair of spaced apart ends adapted to pierce a portion of the deformable section to grip the base, and a retaining portion adapted to squeeze inwardly to extend through an aperture provided in one of the confronting surfaces and expand outwardly once within the aperture to retain the gasket member with the appliance.

4,538,382

APPARATUS FOR SHARPENING A KNIFE BLADE OR THE LIKE

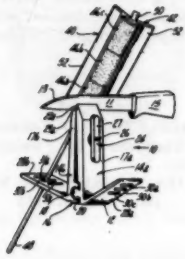
Donald R. Johannsen, Dearborn, Mich., assignor to Bonni S. Carris, Detroit, Mich.

Filed Dec. 1, 1983, Ser. No. 557,193
Int. Cl.³ B24B *3/52*
U.S. Cl. 51—69 **19 Claims**

1. An apparatus for manually sharpening a cutting implement, said apparatus comprising:

a frame assembly having securing means thereon for removably securing said cutting implement in a fixed position relative to said frame assembly; abrading means including a plurality of abrading members engageable with said cutting implement and slidably movable with respect to said cutting implement during said engagement for abrad-

ingly forming a sharpened cutting edge portion thereon; said abrading means including an elongated body portion, an elongated rod-like member connected to said elongated body portion and being pivotally engageable with said frame assembly, said plurality of abrading members secured to said body portion with each having an abrading surface of a different coarseness and further being selectively engageable with said cutting implement at said substantially constant angular relationship therewith during the slidable movement relative thereto, said abrading



members being secured to said body portion in longitudinal alignment with each other with their abrading surfaces oriented generally in the same direction; and

said abrading means including handle means on a rearward side thereof adapted to be gripped by a user and shield means disposed generally between said handle means and said abrading member, said shield means extending laterally outwardly from said handle means a distance at least equal to the lateral width of said abrading member, said shield means extending in a direction to be generally rearward of each of said abrading surface.

4,538,383

FRONT SURFACE GRINDING MACHINE AND METHOD

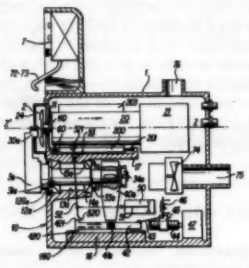
René Le Marer, Kerougan Bras, 22730 Tregastel, and Robert P. Delebecque, 156bis, rue d'Aulnay, 92290 Chatenay Malabry, both of France

Filed Dec. 9, 1982, Ser. No. 448,070

Claims priority, application France, Dec. 18, 1981, 81 23721

Int. Cl.³ B24B *1/00, 7/00*

U.S. Cl. 51—124 R **30 Claims**



1. A front surface grinding machine adapted to have a front surface abrasive wheel mounted thereon comprising:

a wheelhead spindle for carrying the abrasive wheel,

means for rotating said wheelhead spindle,

a holder for carrying a workpiece,

first means for imparting back and forth rotational motion to said workpiece holder about an axis parallel to an axis of said wheelhead spindle and in a circular sector having first and second points, the workpiece carried by said holder being rotated between the front and the side of a front working surface of said abrasive wheel when the holder is at the first and second points respectively,

second means for imparting back and forth translational motion to said wheelhead spindle, the translational motion being along the spindle axis between a first position where the workpiece is ground by said abrasive wheel working surface and a second position where said abrasive wheel is disengaged from the ground workpiece in front of said front working surface of said abrasive wheel, and

drive means cooperating with said first and second imparting means for driving the spindle so the abrasive wheel is pulled from said first position to said second position while said workpiece holder rotates from the front to the side of said abrasive wheel working surface where the ground workpieces are removed, the rotary speed of said workpiece holder in moving from the side to the front of said abrasive wheel front working surface, where the workpieces are ground by the abrasive wheel, being slower than the rotary speed of the workpiece holder in moving from the front to the side of the abrasive wheel front working surface where the ground workpieces are not contacting the abrasive wheel.

4,538,384

METHOD FOR GRINDING OR CUTTING A WORKPIECE

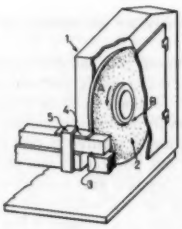
Johann Huber, Nr. 373, A-6233 Kramsach, and Otto Thanner, Innsbruckerstr. 45, 6130 Schwaz, both of Austria

Filed Jul. 15, 1982, Ser. No. 398,594

Claims priority, application Austria, Jul. 20, 1981, 3190/81

Int. Cl.³ B24B *1/00, 55/02*

U.S. Cl. 51—322 **8 Claims**



1. A method of cutting a workpiece at a cutting zone using an abrasive cutting article having a cutting surface and made at least of abrasive grain and a binder, comprising:

applying an active solid body which is solid at a temperature between 1° C. and 200° C., into direct contact with the workpiece, with a portion of the active solid body lying adjacent the cutting zone of the workpiece, the active solid body being formed by active material or containing active fillers; and

moving the cutting surface of the abrasive article past the portion of the active body and past the cutting zone for cutting the workpiece at its cutting zone and for utilizing the active solid body.

4,538,385

PROTECTIVE COVER FOR COTTON MODULE

Ernest Kandarian, 1846 Mitchell, Clovis, Calif. 93612

Filed May 23, 1983, Ser. No. 496,885

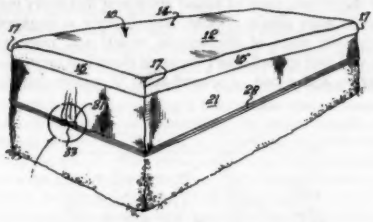
Int. Cl.³ B62D *63/04*

U.S. Cl. 52—3 **9 Claims**

1. A protective cover for a cotton module formed of a relatively large volume of cotton compressed into a generally parallelepiped configuration comprising:

a water repellent cap portion adapted to fit about the top of the module and extending downwardly therefrom;

means defining a skirt portion connected to and depending from said cap portion and adapted to encircle the mid-portion of the module, said skirt portion comprising an air permeable mesh to provide substantially unobstructed air flow from the ambient air into the module;



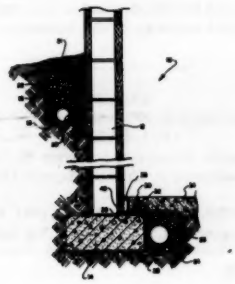
and belt means including means for cinching fastened about the perimeter of said skirt portion for securing said cover about the module without intrusion into the module surface.

4,538,386

DRAINAGE SYSTEM AND METHOD

Robert T. DiCello, Twinsburg, Ohio, assignor to Ohio State Home Services, Inc., Macedonia, Ohio

Filed Sep. 4, 1984, Ser. No. 646,837
Int. Cl.³ L02D 27/00
U.S. Cl. 52—169.5 **15 Claims**



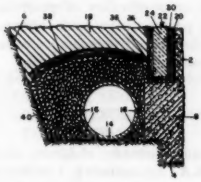
1. A drainage system for draining water away from a building located in ground having a surface above which a portion of the building extends, the building having a horizontal base lying adjacent the ground and walls extending vertically from said base, said system including first drain means located in a first trench provided in the ground beneath said base adjacent the perimeter thereof, said first trench extending around at least a portion of the perimeter of said base and inside of said vertically extending walls, second drain means located in a second trench provided in the ground, said first and second drain means being independent of each other whereby said second drain means does not communicate with said first drain means, said second trench extending around at least a portion of the perimeter of said walls and outside of said vertically extending walls, said second trench being at least about 14 inches wide and about 18 inches deep and not greater than about three feet deep, said base being substantially deeper in the ground than said second drain means, said second trench being lined with a plastic sheet to form a trough for capturing water flowing from the ground surface into said second trench and for preventing water from flowing downwardly along said walls, said second drain means comprising pipe means for receiving water captured in said trough and for conducting said water away from said building, and gravel filling said first and second trenches and covering at least partially said first and second drain means.

4,538,387

DRAINAGE AND INSULATING MATERIAL FOR SUBTERRANEAN WALLS

Loren A. Barnett, 920 Durward Hall Dr., and Clayton C. Smith, 1006 Durward Hill Dr., both of Carthage, Mo. 64836

Filed Dec. 2, 1983, Ser. No. 557,243
Int. Cl.³ E02D 31/02
U.S. Cl. 52—169.5 **13 Claims**



1. A drainage material for subterranean walls comprising a plurality of generally planar panels adapted to be applied in edge-to-edge relation substantially covering the exterior surface of said wall, while said wall is still free-standing and prior to the application of backfill material to said outer wall surface, each of said panels including:

a. a planar slab formed of a material which is normally substantially moisture impervious, but subject to the passage of moisture therethrough as a result of possibly imperfect manufacture thereof, or as a result of cracking, breaking, crushing or piercing thereof by heavy rocks included in the backfill material when said material is applied, said slab having fluid flow passages formed therein parallel to its plane through which ground moisture may flow downwardly to the lower edge of said panel by gravity, said passages opening exteriorly of said slab at areas distributed evenly over the entire area of at least one face thereof to permit said ground moisture to enter thereinto, and

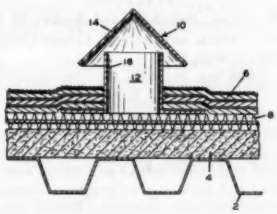
b. a sheet of filter material covering any surface of said slab through which said flow passages open, whereby to permit the passage of moisture to said flow passages therethrough, but to inhibit the passage of sand, ground silt or the like.

4,538,388

POSITIVELY VENTED FLAT ROOF SYSTEM

Paul F. Friesen, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Feb. 7, 1983, Ser. No. 464,390
Int. Cl.³ E04B 7/00
U.S. Cl. 52—199 **4 Claims**



1. A ventilating roof system for providing positive and continuous ventilation of harmful water vapors from the roof

system, said harmful, water vapors being generated above and below the roof system, comprising in combination:

(a) a roofing deck providing the bottom structure of the roof system,

(b) positioned over the roofing deck there being provided fibrous insulation material,

(c) positioned over the fibrous insulation material there being provided a roofing membrane consisting of plural layers of roofing felt bonded together by a conventional roofing tar adhesive to form a water tight membrane, and

(d) the improvement comprising:

(1) a double cuspated surface plastic film means being positioned between the insulation and roofing membrane to form a plurality of positive and continuous ventilating passageways both above and below the membrane to permit the escape of water vapor from the region below the roofing membrane.

4,538,389

FIRE-BREAK

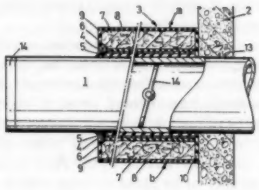
Hans-Dieter Heinen, Malmedy, Belgium, assignor to Intellectual Trade CY S.A., Luxembourg, Luxembourg

Filed May 14, 1982, Ser. No. 378,306

Claims priority, application Luxembourg, May 18, 1981, 83374; Jun. 3, 1981, 83410

Int. Cl.³ E04H *9/00;* **F16K** *17/36*

U.S. Cl. 52—221 **12 Claims**



1. A fire-break for passing a hollow element, such as a pipe, sleeve or tube through a building wall, partition or ceiling, comprising:

an elongated flange formed from a substantially incombustible material mounted about the hollow element and extending to the wall on at least one side thereof, said flange including,

a first layer of a fire-proof material extending to said element and on said wall;

a second layer of incombustible fibers disposed on said layer; and

at least one closable door means mounted within said hollow element and provided with means for closing the door means to block air flow within said hollow element in response to a fire.

4,538,390

INSULATION AND PARTITION MEANS FOR EXISTING BUILDING

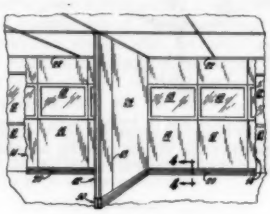
Raymond W. Yeager, Pataskala, and Bradley W. Oberg, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 30, 1982, Ser. No. 430,192

Int. Cl.³ E04H *1/00*

U.S. Cl. 52—221 **5 Claims**

1. A retrofit outer wall insulation and partition wall means for a preexisting building, said means comprising an insulation system applied to an inner side of an exterior wall of the preexisting building and including an enclosed electrical raceway, sound absorbent thermally insulating fibrous glass panels, and H-splines, the H-splines being secured vertically to said exterior wall and retaining the panels to the exterior wall by cooperative engagement with vertical edge portions thereof and the raceway forming a lower trim for the panels, and a partition wall installed in the preexisting building, extending perpendicularly inwardly from the exterior wall, and including two spaced-apart enclosed electrical raceways oriented in back-to-back relationship to each other, a pair of adjacent septum panels each having a lower end portion disposed between the spaced-apart enclosed electrical raceways and extending upwardly therefrom, pairs of sound absorbent thermally insulating fibrous glass panels disposed respectively in engagement with opposite sides of the septum panels and respectively having said two spaced-apart enclosed electrical raceways for lower trim, and a pair of spaced-apart H-splines oriented in



back-to-back relationship to each other with the septum panels therebetween, each H-spline of the partition wall being disposed at a joint between the septum panels and cooperatively engaging vertical edge portions of adjacent ones of the fibrous glass panels of the partition wall, the H-splines of the partition wall having cross sections identical to the cross sections of the H-splines of the insulation system on the exterior wall, and each of the two enclosed electrical raceways of the partition wall having a cross section identical to the cross section of the enclosed electrical raceway of the insulation system on the exterior wall.

4,538,391

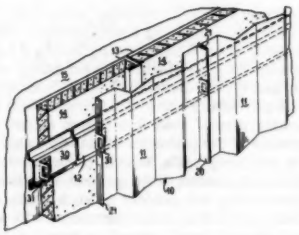
METAL BUILDING PANELS FOR WALL APPLICATIONS

Thomas S. Skrabis, Lemont, and Martin D. Jahn, Riverside, both of Ill., assignors to Chicago Metallic Corporation, Chicago, Ill.

Continuation of Ser. No. 287,132, Jul. 27, 1981, abandoned. This application Oct. 17, 1983, Ser. No. 542,434

Int. Cl.³ E04B *2/56*

U.S. Cl. 52—478 **21 Claims**



1. A structure having at least two parallel extending frame members and having a plurality of interlocked panels mounted on said frame members and extending transverse thereto, said structure comprising at least two metal frame members, each having a planar surface with tabs cut and raised upright from the planar surface at selected intervals, said tabs forming integral clips for use in securing the panels on said members, said frame members being positioned to extend parallel to each other with the clips being aligned with each other; and a plurality of sheet metal panels, each of said panels having parallel

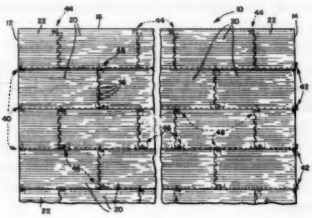
extending first and second edge portions which coact with edge portions of the adjacent panel to interlock the panels together, said first edge portion extending at substantially a right angle from a plane of the panel and having a reversely bent flange with a U-shaped configuration with the free edge of the flange having means for forming a continuous catch, said means for forming a continuous catch being a terminal edge of a reversely bent flap portion at the end of said free edge being bent to extend back into said U-shaped configuration of said flange, the second edge portion having a single second leg portion of a single thickness with a second free edge extending at substantially right angles to the plane of the panel and having integral means comprising a bent crease spaced inward of the second free edge and extending the entire length of the second leg portion for forming a continuous shoulder extending along the length of the panel, said second leg portion of the second edge portion being received and engaged in the clips of the frame members with the clips engaging the second free edge and said second edge portion and clips being received in the first edge portion of the adjacent panel with the first edge portion covering both the second edge portion plus the clips of the frame members as the means for forming a catch engages the shoulder of the second edge portion to form an interlocking connection between adjacent panels so that the clips anchor the two panels at each interlocking connection on the frame member.

4,538,392

PORTABLE SECTIONAL FLOORING SYSTEM

Edward K. Hamar, Calumet, Mich., and Gordon E. Blakeman, New Berlin, Wis., assignors to Horner Flooring Company, Dollar Bay, Mich.

Filed Feb. 9, 1983, Ser. No. 465,152
Int. Cl.³ E04C *1/10*
U.S. Cl. 52—582 **11 Claims**



1. Portable sectionalized flooring for a basketball court or the like comprising:

a plurality of equal width floor sections directly supported on a planar base surface including first and second groups of sections, each group having a different length, said sections being assembled in rows to form a flooring area which defines a plane with the different lengths of said groups positioned within said rows to dispose the joints between sections in adjacent rows in staggered relationship;

each said section having interengaged tongue and groove strips defining a floor surface, each said section having an exposed tongue extending along one side of the section and an exposed groove extending along the other side of the section, said exposed tongue and said exposed groove on the sections in adjacent rows being directly interengaged, at least one end of each said section having projecting fingers defined by selected strips of the section projecting beyond strips intermediate said selected strips whereby said fingers on adjoining longitudinally aligned sections form interlocking fingers joints in each of said rows; and

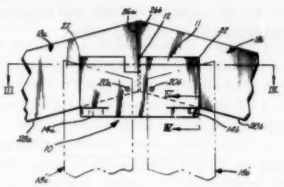
latch means connected to each said section disposed beneath said floor surface interlocking adjoining floor sections within each of said rows and interlocking adjacent rows within said flooring area, said latch means including a series of latch devices with each said device having a pair of separate interengageable elements, said elements of each device being connected, respectively, adjacent the edges of two adjoining floor sections, said pair of elements of each said device being interlockingly interengaged preventing transverse separation of adjacent sections in adjacent rows and preventing longitudinal separation of adjoining longitudinally aligned sections within each row, said latch devices being interengaged and disengaged solely by swinging said two adjoining floor sections relative to each other in said plane of said flooring area.

4,538,393

FOLDING TRUSS

Terry L. Mitchell, Grand Rapids, Mich., assignor to Jer Manufacturing, Inc., Coopersville, Mich.

Filed Nov. 26, 1982, Ser. No. 444,531
Int. Cl.³ E04B *1/344*
U.S. Cl. 52—641 **4 Claims**



1. An improved folding truss including a connector and first and second support members each pivotally connected to the connector whereby the support members can be pivoted between collapsed and extended positions, wherein the improvement comprises the connector comprising:

a body having a generally planar portion to which said first and second support members are pivotally connected;

a locator member extending generally perpendicularly from said body to abut at least one of said first and second support members when said support members are in their extended position for orienting said connector into a desired relation with respect to said one support member; and

detent means supported by said body for locking said first and second support members in their extended position, said locator member and said detent means cooperating to maintain said first and second support members in fixed relation to said connector.

4,538,394

CIRCUMFERENTIAL STEREO SPECTACULAR, 360 DEGREES VERTICALLY AND HORIZONTALLY, WITH LIVE CENTER STAGE BUILT BY ECONOMICAL, UNIVERSAL CONSTRUCTION DEVICES

Henry M. Farnum, Executive House, 225 E. 46 St., New York, N.Y. 10017

Division of Ser. No. 302,901, Nov. 1, 1972, and a continuation of Ser. No. 609,691, Sep. 2, 1975, abandoned. This application Jan. 8, 1979, Ser. No. 1,894
Int. Cl.³ E04C *3/00*
U.S. Cl. 52—664 **12 Claims**

1. A construction apparatus for models and stagecraft comprising:

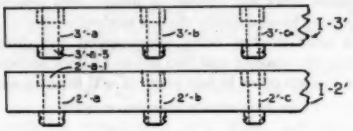
1. a model constructed with a mosaic of locations in at least a segment of a tetrahedron,

2. said tetrahedron constructed with structural elements including linear locations at equal increments,

3. in a first structural element each said location selectively

including two portions of a connector facing outward on opposite sides of said location, and integral therewith,

4. the first said portion including a flexible, resilient snap-ring held within a retaining groove, said location further including a hexagonal hole approximately aligned with the hole in said snap-ring,



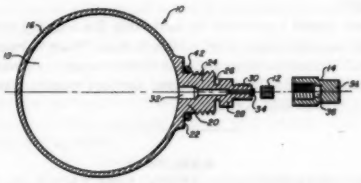
5. the second said portion including a hexagonal protrusion with hexagonal edges which open the corresponding snap-ring of an adjacent, selected location of a second structural element with frictional contact between said ring and the flat, hexagonal surfaces of said protrusion, instantly to assemble said first and second elements at an angle predetermined by the selected relationship between said hexagonal hole and protrusion.

4,538,395

METHOD OF CHARGING AND HERMETICALLY SEALING A HIGH PRESSURE GAS VESSEL

David A. Edmonds, Rte. 1, Box 169, King George, Va. 22485, and Winfred B. Rollins, Box 342, Dahlgren, Va. 22448

Filed Nov. 24, 1982, Ser. No. 444,105
Int. Cl.³ B65B *31/02*; B67B *1/04*
U.S. Cl. 53—403 **1 Claim**



1. A method of charging the chamber of a metal pressure vessel with a highly pressurized gas and thereafter hermetically sealing it for a long shelf life comprising:

providing a pressure vessel with a boss having a small opening extending therethrough terminating at its outer extremity for defining a fill passageway for the chamber;

providing the boss outer extremity with a hard cylindrical lip immediately surrounding the small opening and extending axially beyond the boss outer extremity;

pressurizing the vessel through the small opening;

forcing malleable metal axially against the sharp cylindrical lip for causing the metal to extrude both inside and outside the cylindrical lip for establishing a hermetic seal therewith; and,

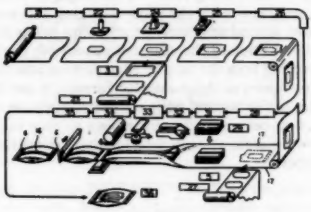
continue forcing the metal in extrusion until it abuts the boss outer extremity.

4,538,396

PROCESS FOR PRODUCING A RE-SEALABLE DISPENSER-CONTAINER

Kenji Nakamura, 3-7, Nishiawaji 6-chome, Higashiyodogawa-ku, Osaka, Japan

Division of Ser. No. 210,682, Nov. 26, 1980, abandoned. This application Nov. 12, 1981, Ser. No. 320,553
Claims priority, application Japan, May, 1980, 55-70397
Int. Cl.³ B65B *61/18*
U.S. Cl. 53—412 **4 Claims**



1. A continuous process for producing from a continuous flexible sheet a re-sealable dispenser-container having solid sheet-like materials for cosmetic or toilet use contained therein comprising:

continuously feeding said continuous flexible sheet of impervious material;

periodically punching an opening of a closed elongated shape at a central portion in said continuous flexible sheet;

periodically disposing a flexible flap, the flap having an adhesive surface covering substantially one entire side of the flap, the flap also having an uncoated tab, on one surface of said continuous flexible sheet in such a manner that the flap covers said opening and that the adhesive surface of the flap contacts and adheres to said surface of said sheet;

periodically fixing one end portion of said flap to said continuous flexible sheet;

periodically disposing a flexible non-adhesive member having a shape and size larger than said opening on the opposite surface of the continuous flexible sheet to cover said opening so that the non-adhesive member is adhered to the adhesive surface of the flap through said opening;

periodically disposing said sheet-like materials for cosmetic or toilet use on the non-adhesive member disposed on the opposite surface of said continuous flexible sheet;

said steps of periodically punching, flap disposing, and fixing being continuously performed on continuously running sheet;

continuously wrapping said continuous flexible sheet around said sheet-like materials for cosmetic or toilet use, with the continuous sheet so folded that longitudinal edges of said continuous sheet are brought together upon each other;

continuously heat sealing the longitudinal edges of the flexible continuous sheet to each other to form a continuous longitudinal heat seal and heat sealing said sheet transversely to form a succession of transversely sealed portions; and

continuously cutting said continuous flexible sheet at said transversely sealed portions to separate said re-sealable dispenser containers.

4,538,397

METHOD AND APPARATUS FOR STORAGE OF PAPER SHEETS AND THE LIKE

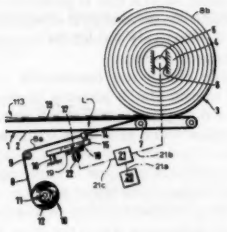
Heinz Boss, Strengelbach, Switzerland, assignor to GRAPHA-Holding AG, Hergiswil, Switzerland

Filed Jun. 6, 1983, Ser. No. 501,018

Claims priority, application Switzerland, Jun. 15, 1982, 3682/82

Int. Cl.³ B65B *63/04*

U.S. Cl. 53—430 18 Claims



1. A method of temporarily storing sheets which consist of paper or the like on a relatively narrow elongated band whose leader is connected to a core having an axial length exceeding the width of the band, comprising the steps of feeding a stream of sheets onto the band; rotating the core so that the band is moved lengthwise and is convoluted onto the core to form a series of convolutions which confine the sheets therebetween; and moving successive increments of the moving band back and forth without twisting of the band and substantially in the axial direction of the core at a location which is remote from the outermost convolution so that successive convolutions are at least partially staggered with reference to each other, as considered in the axial direction of the core.

4,538,398

CARTON SEALING MACHINE WITH SAFETY STOP OF THE CONVEYING BELTS AT THE END OF THE OPERATION

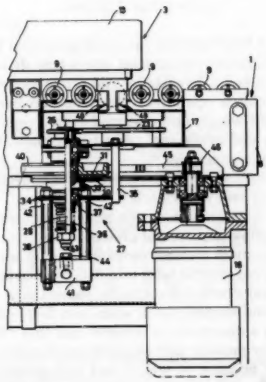
Augusto Marchetti, Piazza Sicilia, 7, 20146 Milano, Italy

Filed Jan. 5, 1983, Ser. No. 455,829

Claims priority, application Italy, Jan. 26, 1982, 19289 A/82

Int. Cl.³ B65B *1/30*

U.S. Cl. 53—493 17 Claims



1. A carton sealing machine for sealing cartons, comprising:

a support base for the cartons;

a movable sealing head movable relative to said base and positionable at variable heights above said base to define with said base a carton sealing area;

driving means for lifting said movable sealing head from a lowered rest position;

conveyor means arranged at opposite sides of said base and movable in a direction towards each other to approach each other from a removed rest position to a carton engaged position, said conveyor means in said rest position being disengaged from opposite sides of the carton and in said engaged position being engaged with opposite sides of the carton for the advancement thereof along a path on said base through said sealing area;

a driving mechanism for said conveyor means;

motion transmission means including a clutch for transmitting the motion from said driving mechanism to said conveyor means in an engaged condition of said clutch and to disconnect said driving mechanism from said conveyor means in a disengaged condition of said clutch; and

a plurality of sensing means successively arranged along said sealing area to sense the position of an advancing carton advancing through said sealing area, said sensing means including a first sensor positioned at the inlet of said sealing area to cause a lifting of said sealing head from said lowered rest position, a second sensor slightly advanced along the path in said sealing area with respect to said first sensor to cause said conveyor means to move to approach each other to reach said engaged position from said removed rest position, and a third sensor positioned at the outlet of the sealing area to move said conveyor means away from the sides of an engaged carton to return said conveyor means to said removed rest position, and said third sensor being operatively connected to said clutch to cause the disconnection of said driving mechanism from said conveyor means for the subsequent stopping thereof.

4,538,399

APPARATUS FOR EVACUATING AND SEALING RECTANGULAR PACKAGES

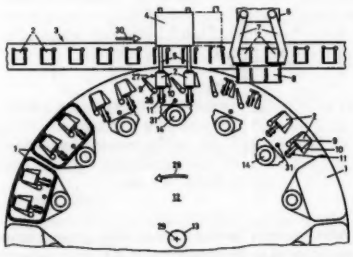
Werner Müller, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jun. 25, 1984, Ser. No. 624,170

Claims priority, application Switzerland, Jun. 24, 1983, 3463/83

Int. Cl.³ B65B *31/04*

U.S. Cl. 53—512 10 Claims



10. In an apparatus for evacuating and sealing rectangular packages having a top face, a bottom face and four side faces, including a turntable rotatable about a vertical axis thereof, a plurality of vacuum hoods, each defining a vacuum chamber, arranged circumferentially on said turntable and means for lifting each vacuum hood into an open position in which a package to be evacuated and sealed is received and for lowering each vacuum hood into a sealed, closed position, the improvement comprising

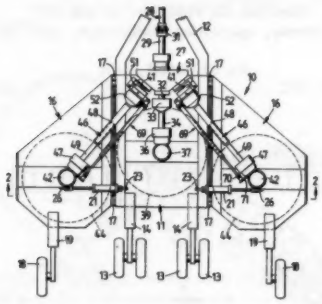
(a) a first surface provided on each hood within the vacuum chamber;
(b) an abutment means arranged on said turntable below each said vacuum hood; each abutment means including a second surface;
(c) means for supporting the abutment means and for displacing the abutment means radially outwardly with respect to said vertical axis in the direction of said first surface for displacing a package towards said first surface by said second surface and engaging the package at opposite sides by said first and second surfaces in the closed position of the respective vacuum hood;
(d) a pair of cooperating package grasping jaws arranged on said turntable below each said vacuum hood for engaging the package at opposite sides adjacent the sides to be engaged by said first and second surfaces;
(e) a base plate arranged on said turntable below each said vacuum hood for engaging a bottom of the package received by the vacuum hood;
(f) means for supporting and vertically displacing said base plate;
(g) sealing means supported by said turntable below each said vacuum hood for sealing a top of the package received by the vacuum hood;
(h) hold-down plates secured to said sealing means; said hold-down plates being arranged to engage a top surface of said package during sealing of said top; and
(i) said first and second surfaces, said package grasping jaws, said base plate and said hold-down plates simultaneously engaging the four sides, the bottom and the top of the package during an operational phase in the course of evacuating and sealing.

4,538,400

ROTARY MOWER HAVING GROUND SUPPORTED FRAMES

Ronald W. Hottes, Selma, Ala., assignor to Allied Products Corporation, Chicago, Ill.

Filed Jun. 11, 1984, Ser. No. 619,715
Int. Cl.³ A01D *69/08, 35/264*
U.S. Cl. 56—11.8 **8 Claims**



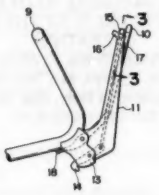
1. In a rotary mower having a translatable ground supported main frame adapted to be connected to a towing vehicle having a power take-off unit:
(a) a transmission unit carried by said main frame and operatively connected in driving relation to said power take-off unit,
(b) at least one translatable wing frame hingedly connected along one side thereof to an adjacent side of said main frame and adapted for pivotal movement selectively to a lower operative position and to an upper inoperative position,
(c) a depending shaft carried by and supported for rotation on said main frame and on said wing frame,
(d) a cutter element carried by each said depending shaft,
(e) means operatively connecting said transmission unit in driving relation with said depending shaft on said main frame,
(f) an extensible drive shaft that is extensible along an axis and that is operatively connected at one end to said depending shaft on said wing frame,
(g) a clutch unit operatively connecting the other end of said extensible drive shaft to said transmission unit and having a clutch actuator adapted to move a component of said clutch unit along an axis that is generally parallel to said axis along which the drive shaft is extensible, whereby the clutch unit is selectively moved to an engaged position and to disengaged position,
(h) an extensible clutch rod operatively connecting said wing frame to said clutch actuator to move said clutch actuator in a direction to move said clutch unit to said engaged position while said wing frame is in said lower operative position and to move said clutch unit to said disengaged position in response to movement of said wing frame to said upper inoperative position, said extensible clutch rod being extensible along an axis that is generally parallel to said axis along which the drive shaft is extensible, and
(i) means to move said wing frame selectively to said lower operative position and to said upper inoperative position.

4,538,401

CONTROL LEVER ASSEMBLY IN A SELF-PROPELLED LAWN MOWER

Masae Takamizawa; Shigenobu Kan, and Masato Mukainakano, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1983, Ser. No. 543,584
Claims priority, application Japan, Oct. 20, 1982, 57-157489; Aug. 10, 1983, 58-146980
Int. Cl.³ A01D *75/20*
U.S. Cl. 56—11.8 **3 Claims**



1. A control lever assembly in a self-propelled lawn mower including a prime mover, at least one wheel drivable by said prime mover, a blade drivable by said prime mover for cutting grass, a first clutch operatively coupled between said prime mover and said wheel, and a second clutch operatively coupled between said prime mover and said blade, said control lever assembly comprising:
(a) a first control lever for selectively connecting and disconnecting said first clutch;
(b) a second control lever for selectively connecting and disconnecting said second clutch;
(c) an engagement element mounted on said second control lever and engageable with said first control lever to cause said second control lever to be moved in a direction to connect said second clutch when said first control lever is moved in a directions to connect said first clutch; and
(d) means for moving said engagement element between an operative position in which said engagement element is engageable with said first control lever and an inoperative position in which said engagement element is held out of engagement with said first control lever, said means comprising a knob integrally formed with said engagement element for moving said engagement element between

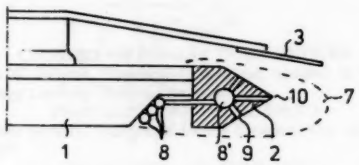
said operative and inoperative positions and including a mechanism connected to said knob for locking said second control lever in a position to disconnect said second clutch.

4,538,402

DEVICE FOR PREVENTING THE JAMMING OF A DISC MOWER BY, OR THE BREAKING UP, A LAYER OF SOIL AND PLANT MATTER

Paul E. Müller, Herdernstrasse 16, CH-8004 Zurich, Switzerland

Filed Aug. 19, 1983, Ser. No. 524,603
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—13.6 **5 Claims**



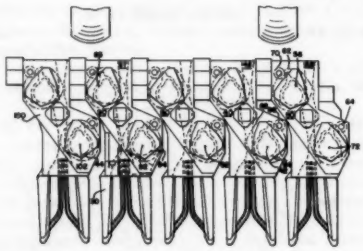
1. Device for preventing clogging and effective for breaking up soil and plant matter in a disc mower which is provided with drive means disposed in a drive casing for driving disc-shaped rotary cutting members and knives attached thereto and is further provided with slide shoes and stone guard members secured on said drive casing characterized in having at the front face of said drive casing (1) below the plane of said blades (3) and between said rotary cutter discs (4) in an overlap region (6) of said blades, at least one wedge-shaped scraper and deflection element (2) disposed in the front of said drive casing (1), said scraper and deflection element (2) having at least one surface which slopes rearwardly upwardly toward said drive casing and at least one surface which slopes rearwardly downwardly, and wherein pressure supply lines (8) which terminate in nozzles (9) are provided in at least one of said sloping surfaces (60) in the region of said scraper and deflection element (2).

4,538,403

NARROW ROW COTTON HARVESTER AND PICKER UNIT

Robert M. Fachini, Naperville, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Aug. 1, 1984, Ser. No. 636,539
Int. Cl.³ A01D *46/18*
U.S. Cl. 56—44 **10 Claims**



1. A multi-row picker cotton harvester comprising:

a first drum unit with a first fore-and-aft plant passage, said first drum unit including:

a first forward picker rotor with a rotational axis and orbit on a first side of said first fore-and-aft passageway; and

a first rear picker rotor with a rotational axis and orbit on the side of said first fore-and-aft passageway opposite said first side; and

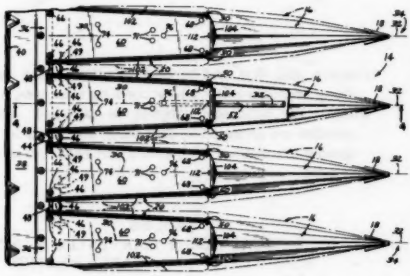
at least a second drum unit with a second fore-and-aft plant passage including a second forward picker rotor with an orbit, wherein a line being generally parallel to said second fore-and-aft passageway and tangent with said second forward picker rotor orbit intersects said first rear rotor orbit.

4,538,404

ADJUSTABLE CROP DIVIDER APPARATUS

Charles J. Heimark, Jr., and Charles J. Heimark, Sr., both of Clarkfield, Minn., assignors to General Dryer Corporation, Clarkfield, Minn.

Filed Aug. 16, 1983, Ser. No. 523,718
Int. Cl.³ A01D *45/00*
U.S. Cl. 56—314 **12 Claims**



1. A crop harvesting apparatus comprising a base and a plurality of crop dividers, each of said crop dividers having a longitudinal plane, a rearward width and a forward width, and each of said crop dividers comprising:

(a) a body;

(b) means for adjusting the rearward width of said crop divider and independently adjusting the forward width of said crop divider;

(c) means for operatively connecting said width adjusting means to said body; and

(d) means for operatively connecting said crop divider to said base, wherein said longtidunal planes of said crop dividers are substantially parallel and said crop dividers form a plurality of slots therebetween, wherein the forward and rearward widths and the configuration of each of said slots are adjustable.

4,538,405

PORTABLE COFFEE HARVESTING MACHINE

Victor M. Alexandrino, P.O. Box 882, Fajardo, P.R. 00648

Continuation-in-part of Ser. No. 329,865, Dec. 11, 1981, abandoned. This application May 24, 1983, Ser. No. 497,594
Int. Cl.³ A01D *46/06*
U.S. Cl. 56—330 **10 Claims**

1. Apparatus for harvesting coffee berries comprising:

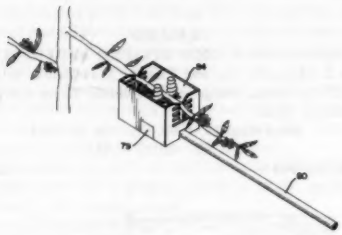
(a) a base member;

(b) first and second spindle means extending outwardly from said base member in a first direction for receiving a branch from a coffee plant therebetween in a direction transverse to said first direction and for engaging and removing said coffee berries from said branch, each of said spindle means being tapered with respect to an axis of rotation and having a helicoidal groove on an exterior surface, the helicoidal groove of said first spindle having a pitch opposite to the pitch of the helicoidal groove of said second spindle, the spacing between said helicoidal grooves increasing in said first direction whereby said coffee berries may be

engaged between said helicoidal grooves and pulled from said branch by rotation of said spindles;

(c) means coupling said first spindle to said second spindle to cause said first and second spindles to rotate in opposite directions;

(d) handle means attached to said base member and extending outwardly therefrom;



wherein said first and second spindles extend outwardly along respective first and second parallel axes; and

wherein the helicoidal grooves on said first and second spindles are arranged so that crests and roots on said first spindle are aligned with crests and roots on said second spindle.

4,538,406

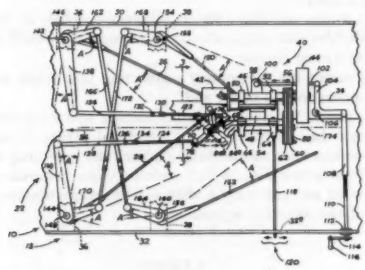
MECHANICAL BERRY HARVESTER HAVING ROW-WIDTH-ADJUSTABLE BEATER

Eugene G. Littau, Aumsville, Oreg., assignor to Littau Harvester, Inc., Stayton, Oreg.

Filed May 4, 1983, Ser. No. 491,390

Int. Cl.³ A01D *46/00*

U.S. Cl. 56—330 **2 Claims**



1. A harvesting apparatus transportable relative to the ground having a vine-receiving zone disposed about a generally vertical plane comprising

a frame,

at least one beater means pivotably mounted on said frame for swinging in the zone,

reciprocating drive means mounted for selectable position adjustment on said frame,

means drivingly connecting said drive means to said one beater means for reciprocatively swinging the latter in a known arc in such zone, and

means for selectively adjusting the position of said drive means relative to said frame in a manner varying the angular position of said arc within said zone,

said drive means providing reciprocating motion generally in a predetermined direction and said adjusting means including means operatively attached to said frame and to said drive means for adjusting the position of said drive means in the predetermined direction.

4,538,407

METHOD OF AND APPARATUS FOR SPLICING SPUN YARNS

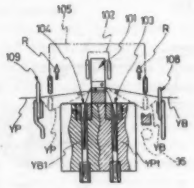
Isamu Matsui, Kyoto, and Koji Deno, Shiga, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Dec. 27, 1983, Ser. No. 565,927

Claims priority, application Japan, Dec. 12, 1982, 57-230476

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **17 Claims**



1. A method of splicing spun yarns wherein extremities of ends of two yarns which are inserted in overlapping and oppositely directed relationship in a yarn splicing hole are spliced on the other by applying compressed fluid thereat, the method comprising the steps of:

holding said yarn ends so that the extremities of the ends of the two yarns are in free conditions; and

then turning at least two portions of said yarn ends which are overlapped on the other within said splicing hole in opposite directions at respective positions thereof so that the extremity of one yarn turns around the other yarn and so that the extremity of the other yarn turns around said one yarn.

4,538,408

METHOD AND APPARATUS FOR CONTROLLING THE THREAD JOINING PROCESS IN AN OPEN END ROTOR SPINNING MACHINE

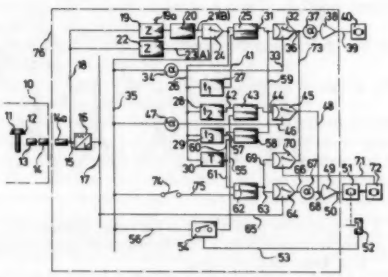
Erwin Baltsch, Nettetal; Heinz-Dieter Göbbels, Monchen-Gladbach; Hans Grecksch, Monchen-Gladbach; Manfred Lassmann, Nettetal; Hans Raasch, Monchen-Gladbach, and Helmut Schlösser, Viersen, all of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 12, 1982, Ser. No. 441,231

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144776

Int. Cl.³ D01H *15/02*

U.S. Cl. 57—263 **18 Claims**



1. Method for controlling a thread joining process having

several thread joining steps and occuring by starting a rotor of an open end rotor spinning machine, which comprises performing a first thread joining step, adjusting the speed of the rotor in a narrow limited range for the beginning of a starting process of another thread joining step which occurs after the first thread joining step, selectively starting and finishing additional thread joining steps in substantially constant given intervals before and after the beginning of the starting process, beginning the first thread joining step with the start of pre-feeding a fiber quantity into the rotor being necessary for thread joining, starting the return of the joined thread end to the rotor in given intervals, selectively decreasing and interrupting the pre-feeding, restarting fiber feeding, stopping a decrease in fiber feeding, and beginning unwinding of the thread from the rotor.

4,538,409

CROSSED BELT FALSE TWIST DEVICES

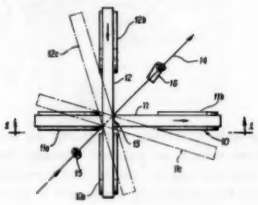
Denys W. Brough, Macclesfield, England, assignor to Rieter-Scragg Limited, Cheshire, England

Filed Sep. 27, 1983, Ser. No. 536,272

Claims priority, application United Kingdom, Oct. 12, 1982, 8229169

Int. Cl.³ D02G *1/06*; D01H *7/92*

U.S. Cl. 57—336 **12 Claims**



1. A crossed belt false twist device, comprising:

a first and second pair of pulleys;

a belt trained over each of said first and second pair of pulleys so as to provide first and second free unsupported belt runs, said first free run travelling from a first pulley to a second pulley and crossing at a crossing region with said second free run, the mid-point of said crossing region being nearer to said first pulley of said first pair of pulleys than to said second pulley of said first pair of pulleys.

4,538,410

COMPRESSOR DIFFUSER NON-RETURN VALVE AND METHOD FOR STARTING GAS TURBINE ENGINES

Per Klaebo, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrikk, Norway

Continuation-in-part of Ser. No. 395,997, Jul. 7, 1982, abandoned. This application May 9, 1984, Ser. No. 608,369

Int. Cl.³ F02C *7/268*

U.S. Cl. 60—39.02 **16 Claims**

1. Apparatus for starting a gas turbine engine of the type having a rotary compressor for compressing air, a combustor for combusting the compressed air with fuel to produce combustion gases under pressure, and a turbine for expanding the combustion gases to produce mechanical work, the turbine and the compressor being coupled for dependent rotation, the apparatus comprising:

(a) diffuser means operatively connected to the rotary compressor to receive and convert the high velocity air to low velocity, higher pressure air;

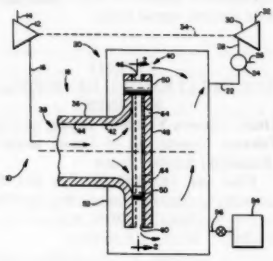
(b) means operatively connected to said diffuser means for receiving and collecting the low velocity, higher pressure compressed air and channeling said higher pressure air to said combustor, said collecting means including a housing, a high pressure gas flow path being defined through said diffuser means and said housing, and to the combustor;

(c) means for supplying pressurized gas to said housing at a point upstream of the combustor and downstream of said diffuser means in said flow path during engine startup; and

(d) valve means integral with said diffuser means for preventing reverse flow of said pressurized gas through the compressor, the pressurized gas flowing through the combustor and being expanded in the turbine to cause rotation of the turbine and the compressor and to establish a flow of pressurized air to the combustor,

wherein said diffuser means includes a plate-type radial diffuser and said housing means receives higher pressure air from said plate diffuser, and wherein said valve means is associated with said plate diffuser, and wherein said plate diffuser includes

(i) a nozzle portion having an inner edge defining an axially



directed plate diffuser inlet, and a radially directed flared outer edge,

(ii) a planar member oriented perpendicular to said plate diffuser inlet axis and spaced from said nozzle,

(iii) a plate member positioned between said nozzle and said planar member, the radially outer portion of said plate member together with the spaced adjacent outer nozzle edge forming a radially directed plate diffuser exit when said plate member abuts said planar member, and

(iv) plate securing means for providing unrestricted axial movement of said plate member between an unsealing position against said planar member and a sealing position against said nozzle, the introduction of said pressurized gas during startup causing a net pressure force on said plate to move said plate member to said sealing position, and the impact force of high velocity air from the compressor during subsequent normal operation causing movement of said plate member to said unsealing position.

4,538,411

AUTOMATIC INITIATION SYSTEM FOR REGENERATING A PARTICULATE FILTER TRAP

Wallace R. Wade, Farmington Hills, and Vemulapalli Durga N. Rao, Bloomfield Township, Oakland County, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/02069, § 371 Date Dec. 27, 1983, § 102(e) Date Dec. 27, 1983, PCT Pub. No. WO85/02883, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 27, 1983, Ser. No. 620,044

Int. Cl.³ F01N *3/02*

U.S. Cl. 60—274 **9 Claims**

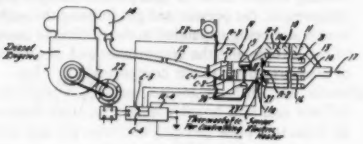
1. A method of initiating the energization of a regeneration apparatus used with a particulate filter trap having a porosity effective to extract particulates from the exhaust gas flow of an internal combustion engine, said method comprising:

(a) sensing the actual pressure drop across said filter trap placed in the flow of exhaust gas:

(b) sensing the actual pressure drop across a simulative filter structure also placed in the flow of said exhaust gas flow,

said simulative filter structure having a porosity effective to allow the passage of particulates therethrough;

(c) comparing the sensed value of (a) to the sensed value of (b) multiplied by a reference multiple needed to make the pressure values equal when the filter trap is free of particulates;



(d) converting the ratio of step (c) to an electric signal; and

(e) using said electric signal to control the energization of said regeneration apparatus when said signal exceeds an allowable electric signal limit.

4,538,412

EXHAUST GAS CLEANING DEVICE FOR DIESEL ENGINES

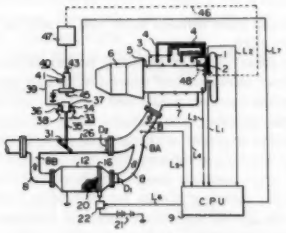
Kiyohiko Oishi, Susono; Yasuhiko Ishida, Mishima, and Kenichirou Takama, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 14, 1983, Ser. No. 484,958

Claims priority, application Japan, Aug. 6, 1982, 57-136388

Int. Cl.³ F01N *3/02*

U.S. Cl. 60—288 **5 Claims**



1. An exhaust particulate cleaning device for a diesel engine comprising:

a main passageway for exhaust gas having uniformly sized upstream and downstream portions and a middle portion between and narrower than the upstream and downstream portions;

a trap case provided in the middle portion of the main passageway;

a filter material disposed in the trap case for catching within the filter material particulates contained in the exhaust gas when the exhaust gas passes through the filter material;

a heater means disposed at an upstream end of the filter material for igniting and burning the exhaust particulates trapped in the filter material;

a bypass passage for the exhaust gas which bypasses the trap case and extends between the upstream and downstream portions of the main passageway, the bypass passage having an inner diameter the same size as the upstream and downstream portions of the main passageway and extending along a line of smooth flow of the exhaust gas discharged from the engine;

a control valve means in the bypass passage for opening and closing the bypass passage;

a signal means for generating a signal indicating commencement of ignition of the exhaust particulates in the filter material;

a control means responsive to the signal to open the control valve means for a predetermined short period following receipt of the signal to allow a substantial amount of the exhaust gas to pass through the bypass passage during burning of said exhaust particulates, and for closing the control valve at the end of the short period to allow said exhaust gas to pass through the filter material.

4,538,413

PARTICLE REMOVING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

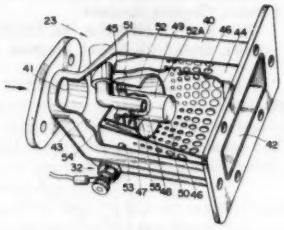
Motohiro Shinzawa; Motomi Arai; Shomatsu Roppongi, all of Yokosuka; Kichihiko Dozono, Kagoshima, and Yoji Hasegawa, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 15, 1983, Ser. No. 552,303

Claims priority, application Japan, Nov. 19, 1982, 57-201825

Int. Cl.³ F01N *3/02*

U.S. Cl. 60—303 **5 Claims**



1. A particle removing system for an internal combustion engine from which an exhaust passage extends to conduct exhaust from the engine, the system comprising:

(a) means for producing a mixture of air and fuel;

(b) a filter disposed in the exhaust passage for catching particles in the exhaust and thereby separating the particles from gas in the exhaust; and

(c) a burner disposed in the exhaust passage at a position upstream of the filter, the burner being connected to the mixture producing means for receiving the mixture, the burner being operative to burn the mixture and thereby burn off the particles caught by the filter;

the burner comprising:

(1) a casing defining a part of the exhaust passage;

(2) a combustion liner disposed within the casing and having a closed upstream end and an open downstream end attached to the casing, the combustion liner having peripheral walls spaced from the casing and formed with a plurality of apertures through which the exhaust flows into the combustion liner;

(3) a mixture pipe, connected to the mixture producing means and extending into the combustion liner through walls of the casing and the combustion liner, for conducting the mixture into the combustion liner;

(4) a vaporizing tube disposed within the combustion liner and surrounding an outlet of the mixture pipe, the vaporizing tube and the mixture pipe defining a first space therebetween, the vaporizing tube having closed first and second ends, the closed first end of the vaporizing tube being operative to reverse the direction of the mixture flow to promote vaporization of the fuel in the mixture, the vaporizing tube having an outlet near its closed second end, whereby the mixture flows from the outlet of the mixture pipe to the outlet of the vaporizing tube through the first space;

(5) a guide tube disposed within the combustion liner and surrounding at least the part of the vaporizing tube defining the outlet thereof, the guide tube and the vaporizing tube defining a second space therebetween, the guide tube having a closed end and an open end, the guide tube being

operative to guide the mixture from the outlet of the vaporizing tube into the combustion liner through the second space and the open end of the guide tube; and

(6) a glow plug extending into the second space for igniting the mixture in the second space.

4,538,414

APPARATUS FOR PREVENTING BLOWING OUT OF THE WATER SUPPLY OF CONSTANT PRESSURE AIR STORAGE INSTALLATIONS OF GAS TURBINE POWER PLANTS

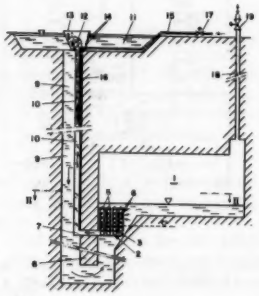
Abdel Saleh, Hohentengen-Herdern, Fed. Rep. of Germany, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jan. 27, 1983, Ser. No. 461,471

Claims priority, application Switzerland, Feb. 17, 1982, 973/82

Int. Cl.³ F15B *11/06*

U.S. Cl. 60—398 **5 Claims**



1. In an apparatus for preventing the blowing out of a water supply from a water shaft in a constant pressure air storage installation for a gas turbine power plant containing a subterranean cavern for storing compressed air, conduit means for connecting said cavern and said gas turbine or a compressor thereof, respectively, a compensation basin having a floor and flow communicating with the water in said cavern through said water supply, the improvement which comprises:

a grate of tubes firmly anchored in said cavern below a lowest permissible water level thereof;

said tubes forming said grate being provided with suction holes;

a header communicating with said tubes of said grate;

said header extending from said cavern into said water shaft and continuing upwardly therein in the form of a riser tube opening into said compensation basin;

an aeration tube and a source of compressed air connected thereto;

said aeration tube having an open end; and

said open end of said aeration tube opening into said riser tube at an upper portion of said water shaft.

4,538,415

POTENTIAL ENERGY ACCUMULATING SYSTEM USING MULTIPLE TYPES OF ENERGY INPUT

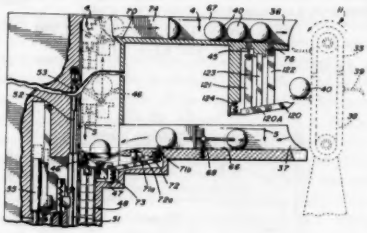
Maurice Lebecque, 7849 Bloomfield St., Apt. 3, Montreal, Canada H3N 2H4

Continuation-in-part of Ser. No. 422,887, Sep. 24, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 591,673

Int. Cl.³ F03G *3/04*

U.S. Cl. 60—639 **15 Claims**

1. In a potential energy accumulating system, a weight lifting means operatively defined and extending from a lower entry to an upper exit and capable of successively conveying discrete weights from the entry to the exit, power input means driving said weight lifting means, upper and lower trough means communicating with said exit and entry respectively and each having an inlet and an outlet, said upper trough means having storage means for containing a multiple amount of such weights, the outlet of said upper trough means adapted to



discharge discrete weights from an upper level, means to return said discrete weights back to the inlet of said lower trough means and a weight regulator positioned at the outlet of the upper trough means to time regulate the falling of the weights off said last-named outlet.

4,538,416

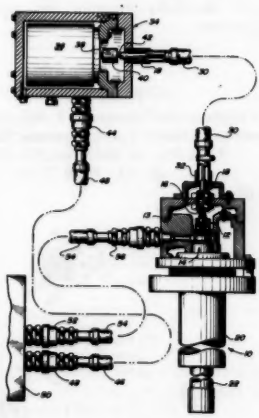
METHOD AND APPARATUS FOR VALVE MOTOR ACTUATION OF A DISPLACER-EXPANDER REFRIGERATOR

Richard C. Riedy, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 29, 1983, Ser. No. 537,472

Int. Cl.³ F25B *9/00*

U.S. Cl. 62—6 **3 Claims**



1. In a cryogenic refrigerator of the type comprising as a unitary structure, a housing containing a piston, said piston and said housing defining a variable volume chamber, means to cause reciprocation of said piston by admission of a high-pressure fluid to said variable volume chamber, said high-pressure fluid causing movement of said piston to produce refrigeration by expansion of said fluid, rotary valve means to admit and exhaust fluid from said variable volume chamber, and a motor coupled to said rotary valve means for rotation of a valve in said rotary valve means, the improvement comprising:

removing said motor from said valve assembly for mounting at a location remote from said rotary valve means and coupling said motor to said valve by means of an elon-

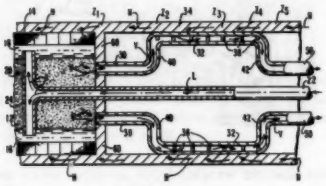
gated shaft disposed within a fluid conduit used to admit a high-pressure fluid to said refrigerator.

4,538,417

VAPOR TRAP FOR SUPERCOOLED ROTOR

Phillip W. Eckels, Penn Hills, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 9, 1983, Ser. No. 502,790
Int. Cl.³ F17C *7/02*
U.S. Cl. 62—55 **4 Claims**



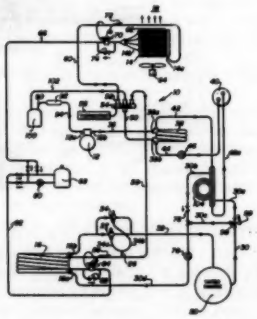
1. A supercooled rotor, comprising:
a coolant reservoir;
a torque tube;
an exhaust pipe connected in fluid communication with said coolant reservoir, said exhaust pipe being disposed within a central bore of said torque tube, a first portion of said exhaust pipe being disposed in contact with said torque tube, said first portion of said exhaust pipe having a plurality of baffles disposed therein;
a vapor trap disposed in fluid communication with said exhaust pipe between said reservoir and said first portion of said exhaust pipe, said vapor trap being in fluid communication with said reservoir and said first portion of said exhaust pipe; and
means for thermally insulating said vapor trap from said torque tube.

4,538,418

HEAT PUMP

John P. Lawrence, and Manoucher Felfeli, both of Austin, Tex., assignors to DeMarco Energy Systems, Inc., Austin, Tex.

Filed Feb. 16, 1984, Ser. No. 580,674
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—79 **3 Claims**



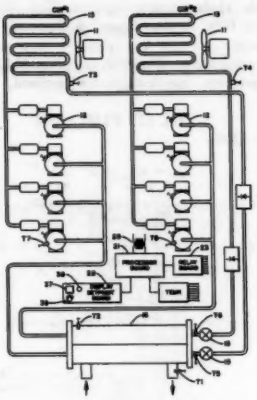
1. A heat pump system comprising:
heat exchanger means; and
fluid conduit means for supplying pressurized water from a municipal water reservoir to said heat exchanger means such that water is supplied to said heat exchanger means and returned directly to said municipal water reservoir without contamination or reduction in volume of said municipal water reservoir.

4,538,419

REFRIGERATION UNIT CONTROLS

Richard G. Lord, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,330
Int. Cl.³ G01K *13/00*
U.S. Cl. 62—129 **4 Claims**



1. A method of testing the electronic controls of a refrigeration unit from a built in field test panel having a digital display, a digital display control switch, a plurality of condition sensor means, and a test logic circuitry having a preprogrammed procedure comprising the steps of:
electrically connecting output signals of the plurality of condition sensor means to the inputs of a microprocessor control;
generating a series of test signals from the preprogrammed procedure of the test logic circuitry of the microprocessor;
operating the digital display control switch to sequentially advance said series of test signals; and
displaying the series of test signals on the digital display as the digital display control switch is operated.

4,538,420

DEFROST CONTROL SYSTEM FOR A REFRIGERATION HEAT PUMP APPARATUS

Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

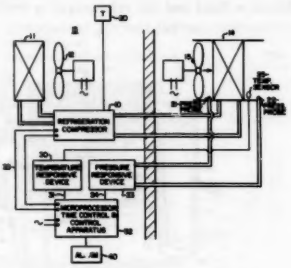
Filed Dec. 27, 1983, Ser. No. 566,018
Int. Cl.³ F25D *21/02*
U.S. Cl. 62—140 **15 Claims**

1. In a control system for refrigeration heat pump having an outdoor coil through which air is blown by a fan extracting heat from outdoor air and defrost means to periodically heat the outdoor coil to remove the frost comprising,
differential pressure responsive means adapted to respond to the differential air pressure across the outdoor coil,
time controlled means adapted for periodically operating the heat pump for a predetermined total time controlled operation sufficient to bring about the frosting of the outdoor coil under predetermined outdoor ambient conditions and thereafter operating said defrost means, whereby a value of differential pressure is measured at the end of said time total period,
memory means for maintaining said value of differential air

pressure across the coil at the end of said predetermined total time period,

control means adapted to control the heat pump between said periodic total time controlled operations for normal operations for new time period extending until said pressure responsive means responds to said value of differential air pressure, and

connection means connecting said differential pressure responsive means to operate said defrost means when said value of differential air pressure is attained.



4,538,421

REFRIGERATING SYSTEM

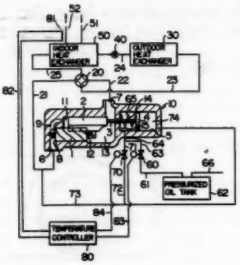
Yasuo Kawamoto, Shimizu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1984, Ser. No. 600,907

Claims priority, application Japan, Apr. 15, 1983, 58-65354

Int. Cl.³ F25B *13/00*; F25D *17/02*

U.S. Cl. 62—157 **2 Claims**



1. A refrigerating system comprising screw compressor means which is adapted to control the flow rate of a refrigerator fluid flowing therethrough by means of a slide valve provided in said compressor means and operatively associated with hydraulic actuator means, said hydraulic actuator means having hydraulic fluid supplying means and hydraulic fluid discharging means which are connected thereto and provided with stop valve means, respectively, for controlling the supply and the discharge of a hydraulic fluid to and from said hydraulic actuator means to permit said hydraulic actuator means to hydraulically actuate said slide valve thereby to increase or decrease the flow rate of the refrigerant fluid in said compressor means, wherein the improvement comprising:

means for selectively switching the operation of said system from either one of a mode for producing warmed water and a mode for producing chilled water to the other mode;

detecting means for detecting the outlet water temperature of an indoor heat exchanger of said system;

temperature control means for setting a water temperature for service, said temperature control means having a timer built therein and an arithmetic and logic circuit adapted to evaluate the difference between the set water temperature and the outlet water temperature inputted from said detecting means and compute the operation period of said timer in proportion to the evaluated temperature difference;

control circuit means for connecting said timer with said stop valve means to control the operation of said stop valve means in proportion to the temperature;

wherein said slide valve is adapted to be subjected at one end thereof to the pressure of the compressed refrigerant fluid, said hydraulic actuator means comprises a piston connected to said slide valve, a cylinder slidably receiving said piston and a spring mounted between said piston and said cylinder to urge said slide valve through said piston in a direction for decreasing the flow rate of the refrigerant fluid when the pressure of the compressed refrigerant fluid acting on said slide valve is below a predetermined value, said hydraulic fluid supplying means comprises a hydraulic fluid supplying passage and a pressurized hydraulic fluid tank, and said hydraulic fluid supplying passage interconnects said pressurized hydraulic fluid tank in fluid communication with said cylinder through said stop valve means and opens into a space defined in said cylinder on the urged side of said piston.

4,538,422

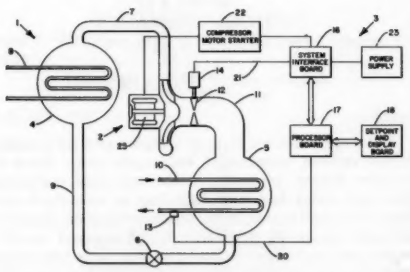
METHOD AND CONTROL SYSTEM FOR LIMITING COMPRESSOR CAPACITY IN A REFRIGERATION SYSTEM UPON A RECYCLE START

Gordon L. Mount, W. Monroe, and William J. Lavigne, Jr., Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 14, 1984, Ser. No. 610,057

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—201 **7 Claims**



1. In a method of operating a vapor compression refrigeration system including a compressor which is part of the refrigeration system, including the steps of:

monitoring a load to be satisfied by operation of the refrigeration system;

turning on the refrigeration system, including the refrigeration system compressor, when the step of monitoring detects a load to be satisfied by operation of the refrigeration system;

adjusting the capacity of the refrigeration system to match the load on the refrigeration system when the refrigeration system is turned on to satisfy the load detected by the step of monitoring;

turning off the refrigeration system compressor when, to match a low load, the refrigeration system is adjusted to its minimum capacity level by the step of adjusting and the refrigeration system is providing excess capacity for satis-

fying this low load even through the refrigeration system is operating at its minimum capacity level;

a recycle start method for greatly reducing the rate of increase in the capacity of the compressor upon a recycle start, comprising the steps of:

turning the refrigeration system compressor back on when the step of monitoring detects a new and relatively small increased load to be satisfied by operation of the refrigeration system after the refrigeration system compressor has been turned off due to excess capacity;

increasing the capacity of the refrigeration system from its minimum capacity level toward its maximum capacity level at a preselected, relatively slow rate which is less than the rate required immediately to match the load on the refrigeration system; and

repeating the step of adjusting when the capacity of the refrigeration system is increased by the step of increasing to a level which matches the new, relatively small increased load on the refrigeration system.

4,538,423

COOLING APPARATUS AND COOLING TRAP INCLUDING SUCH AN APPARATUS

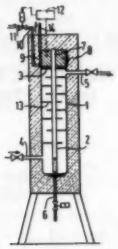
Raymond Le Diouron, Voiron, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed May 3, 1984, Ser. No. 606,516

Claims priority, application France, May 5, 1983, 83 07498

Int. Cl.³ F25B *41/04*

U.S. Cl. 62—222 **14 Claims**



1. An apparatus for cooling a region at a set temperature below ambient temperature but substantially above liquid nitrogen boiling temperature, said apparatus comprising at least one sealed heat pipe including an evaporator portion disposed in said region and a condenser portion disposed outside said region, an isothermal device disposed outside said region and in thermal exchange relation with said condenser portion, and means for supplying a regulated current of liquid nitrogen for maintaining said isothermal device substantially at said set temperature, said heat pipe containing a diphasic fluid whose boiling domain extends on either side of said set temperature.

4,538,424

AIR COOLING UNIT FOR VEHICLE

Joseph Meyers, Cloverdale, Calif., assignor to Gordon G. Waltenspiel, Santa Rosa, Calif.

Filed Feb. 15, 1984, Ser. No. 580,493

Int. Cl.³ F25B *27/00*

U.S. Cl. 62—236 **15 Claims**

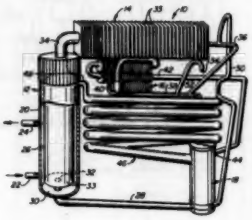
1. A refrigeration unit for a vehicle comprising:

a condenser;

an evaporator coupled with the condenser for receiving a liquified refrigerant therefrom;

an absorber coupled with the evaporator for receiving vaporized refrigerant by gravity flow directly from the evaporator and an absorption fluid capable of absorbing the refrigerant vapor; and

a boiler having a lower end in fluid communication with the absorber and an upper end in fluid communication with the condenser, said boiler having means forming at least part of a heat source for use in heating a mixture of the absorption fluid and the refrigerant in the boiler to create a convection current therein, to vaporize the refrigerant



therein, and to separate the vaporized refrigerant from the absorption fluid therein, whereby the vaporized refrigerant can flow directly from the boiler to the condenser, there being means between the boiler and the absorber for directly returning by gravity flow the absorption fluid separated in the boiler from the vaporized refrigerant to the absorber, said heat source adapted to be coupled to an energy source of the vehicle.

4,538,425

INTEGRAL TYPE AIR CONDITIONING DEVICE

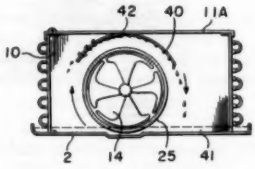
Kenji Ohishi, Yaizu, and Yasuhiko Hashimoto, Fujieda, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1983, Ser. No. 546,463

Claims priority, application Japan, Oct. 29, 1982, 57-190245; Nov. 4, 1982, 57-193870; Nov. 4, 1982, 57-193871

Int. Cl.³ F25B *47/00*

U.S. Cl. 62—280 **5 Claims**



1. An integral type air conditioning device having a main body which is divided by a partition plate into a room interior side and a room exterior side and whereby drain water condensed by a refrigerator at the room interior side is fed to the room exterior side to the splashed onto a condenser for evaporation by a slinger ring formed integrally with a propeller fan wherein said device further comprises:

a fan cover to form a room exterior air course together with said condenser and said propeller fan arranged on a base member; and

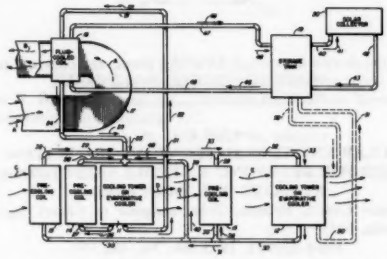
inhibiting means attached to said fan cover, said inhibiting means including a semi-circular water drain guide to prevent drain water drops splashed by said slinger ring from dropping onto said propeller fan and to cause a portion of said drain water drops splashed by said slinger ring to drop onto said base member on said room exterior side of said device.

4,538,426

AIR COOLING SYSTEM

Sumner D. Bock, 16225 N. 29th St., Space 25, Phoenix, Ariz. 85032

Filed Sep. 12, 1983, Ser. No. 531,348
Int. Cl.³ F28D 5/00
U.S. Cl. 62—310 **15 Claims**



1. An indirect evaporative and dry surface cooling system for conditioning the air in a structure, said system including

(a) A first evaporative heat exchange structure adapted to receive hot fluid to be cooled for lowering the temperature thereof;

(b) a second evaporative heat exchange structure adapted to receive hot fluid to be cooled for lowering the temperature thereof, said heat exchange structures each having air inlets and respective outlets;

(c) a first coil for pre-cooling air directed into said first evaporative heat exchange structure, said coil receiving cool fluid from said first evaporative heat exchange structure, said cool fluid coursing through said coil and absorbing heat from air directed over said coil into said first evaporative heat exchange structure;

(d) a second coil for pre-cooling air directed into said first evaporative heat exchange structure, said second coil receiving cool fluid from said second evaporative heat exchange structure and receiving cooled air from said first coil, said cooled fluid from said second evaporative heat exchange structure coursing through said second coil and absorbing heat from air directed over said second coil into said first evaporative heat exchange structure;

(e) fan means for directing air through said first and second pre-cooling coils and into and through said first evaporative heat exchange structure; and

(f) a third coil for cooling air directed into the interior of said structure, said interior air third coil receiving cool fluid from said first evaporative heat exchange structure, said cool fluid from said first evaporative heat exchange structure coursing through said third coil and absorbing heat from air directed over said third coil into said structure.

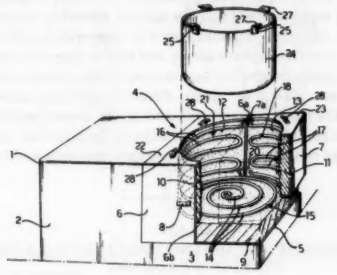
4,538,427

APPARATUS FOR MAKING ICE CREAM AND SIMILAR COLD PRODUCTS AND HAVING A REMOVABLE FREEZER VESSEL

Alfredo Cavalli, 9, Via Galileo Galilei, Pessano Con Bornago (Milan), Italy

Filed Jan. 27, 1984, Ser. No. 574,593
Claims priority, application Italy, Feb. 4, 1983, 19436 A/83
Int. Cl.³ A23G 9/00
U.S. Cl. 62—342 **2 Claims**

1. An apparatus for making ice cream and similar cold products, of the kind having a removable freezer vessel (**24**) and comprising a support structure (**4**) bounding a seat (**12, 13**) for supporting at least one cooling coil (**14**) forming a cylindrical basket (**18**) accessible from the top to receive the removable freezer vessel (**24**), characterised in that at least the side wall of the basket (**18**) is embodied by two substantially half-shell-like parts (**16, 17**) movable relatively to one another between an open position, in which the freezer vessel (**24**) is readily engageable and disengageable between them, and a closed position, in which the basket is substantially restored, the inner diameter of the basket (**18**) being less than the outer diameter of the freezer vessel (**24**), each of the parts of the at least one cooling coil (**14**) which forms the basket (**18**) being independently resiliently yieldable, means (**8**) being provided to maintain the substantially half-shell-like parts (**16, 17**) in the closed position, said substantially half-shell-like parts (**16, 17**) being movable angularly around a generatrix of the cooling basket



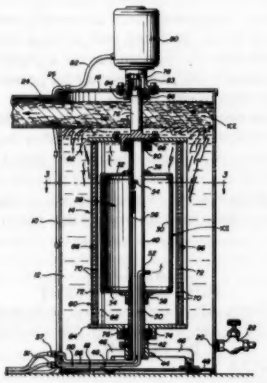
(**18**) and being introduced into and in contact with respective blocks (**10, 11**) made of a support structure (**4**) and bounding the seat (**12, 13**) for receiving the cooling basket (**18**), said cooling basket (**18**) having its base (**15**) in contact with a resiliently yieldable block (**9**) disposed in the support structure (**4**), and further comprising means (**25–27; 28, 29, 29a**) for urging the freezing vessel (**24**) on to the cooling basket base (**15**); whereby effective good contact is maintainable between said removable freezer vessel and said cooling coil in said apparatus.

4,538,428

ICE-MAKING MACHINE

Kenneth L. Wilkerson, Rte. 3, Box 6, De Funiak Springs, Fla. 32433

Filed Apr. 2, 1984, Ser. No. 595,963
Int. Cl.³ F25C 1/14
U.S. Cl. 62—354 **20 Claims**



1. An evaporator structure for submersion in liquid in a holding tank for making ice from the liquid, the structure comprising an enclosed evaporator cell having a cylindrical outer wall, inlet and outlet means for the delivery of refrigerant into and out of the evaporator cell, respectively, means for

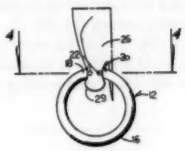
connecting the inlet and outlet to refrigeration plant externally of the tank so as to provide a refrigeration circuit effective to form ice on said cylindrical wall when the structure is immersed in ice-forming liquid in the tank, a rotary scraper assembly associated with the evaporator cell including at least one elongate scraper blade for scraping ice from said cylindrical wall responsive to rotation of the scraper assembly, support means for supporting the evaporator cell and scraper assembly in the tank, and drive means for rotating the scraper assembly, wherein the support means comprises means for supporting the evaporator cell with its longitudinal axis vertically disposed in the holding tank, and wherein the scraper assembly comprises a cage-like assembly surrounding the evaporator cell with upper and lower end plates above and below the cell, respectively, and guide means for said scraper blade connected between the end plates, the guide means comprising sidewalls embracing the blade, an end wall, and spring means positioned between the end wall and an outer edge of the blade for urging an inner edge of the blade toward engagement with said cylindrical wall.

4,538,429

LOBE-PINCHING EARRING WHICH SIMULATES PIERCING EARRING

Darlyne J. Bradford, 1702 McKinley, Des Moines, Iowa 50315

Filed Jan. 5, 1984, Ser. No. 568,343
Int. Cl.³ A44C 7/00
U.S. Cl. 63—14 G **9 Claims**



1. An earring, comprising:

a resilient ring having closely spaced apart confronting ends defining an opening therebetween for receiving an earlobe,

said earring having means for cooperating with the earlobe to retain the earring thereon by pinching the earlobe while simulating the appearance of an earring piercing the earlobe, said means including end portions terminating said ring, each said end portion having a planar surface area with a centrally projecting nodule for pressingly engaging opposite sides of said earlobe,

said nodules being disposed towards one another and having a cross-sectional area sufficiently smaller than that of said end portions of said ring whereby the flesh of said earlobe engaged by the nodules is pinched together such that said planar surface areas of said ring are coplanar with the adjacent earlobe surfaces beyond said planar surface area.

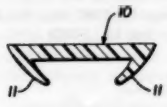
4,538,430

RING SIZING INSERT

Armond O. Parks, 430 Hawthorne Ave., Athens, Ga. 30606

Filed Apr. 26, 1984, Ser. No. 604,234
Int. Cl.³ A44C 9/02
U.S. Cl. 63—15.6 **3 Claims**

1. A ring sizing device formed of a thermoplastics material and being unitary, resilient, and shaped to fit along the inner periphery of a ring shank, said device comprising a plate-like body portion which is substantially flat when in a relaxed state and somewhat deformable under pressure from the finger, and pairs of curved tapering and convergent ring shank engaging claws secured to the opposite sides at opposite ends of the body portion and projecting beyond one face of the body portion to



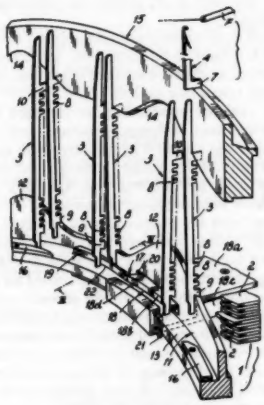
retain the device in position on a ring shank, the opposite face of the body portion being unobstructed and smooth.

4,538,431

CIRCULAR KNITTING MACHINE INCORPORATING A DEVICE FOR RENEWING A NEEDLE SELECTION AT AT LEAST ONE YARN FEED

Francesco Lonati, Brescia, Italy, assignor to Lonati S.p.A., Brescia, Italy

Filed Apr. 11, 1983, Ser. No. 483,530
Claims priority, application Italy, Apr. 20, 1982, 20838 A/82
Int. Cl.³ D04B 9/38, 15/68
U.S. Cl. 66—224 **8 Claims**



1. A circular knitting machine of the type having at least one needle cylinder and a device for renewing a selection of needles at at least one yarn feed, comprising:

at least two yarn feeds

at least one associated pattern selection device

a plurality of tiltable pattern jacks associated with said needles and provided with butts for selection by said pattern selection device

a ring cam having raised portions associated with said yarn feeds to guide the jacks selected to bring the respective needles to knit

a surface radially inside said ring cam for guiding the jacks selected not to follow said raised portions

a guiding cam arranged adjacent to at least one of said raised portions on the inward side thereof

said guiding cam extending in a circumferential direction at least as far as the next following portion of said raised portions

said guiding cam being formed of two members,

a first member having a shape capable of an engagement with the lower ends of said jacks, so as to bring radially inwardly the jacks selected not to climb along said one portion of said raised portions of said ring cam,

said member being movably mounted on said ring cam for a transverse motion to and from said ring cam,

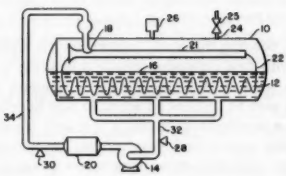
a second fixed member defining with said first member a switching cam adapted to hold said selected jacks radially on the inside when said first member is in an operative position and to return said selected jacks radially to the outside into a selection position when said first member is in an inoperative position.

4,538,432

OPTIMUM PRESSURE CONTROL

Lewis A. Bishop, Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 29, 1983, Ser. No. 566,673
Int. Cl.³ D06B *3/10*
U.S. Cl. 68—5 C **3 Claims**



1. An apparatus for treating a textile material in continuous loop forms under pressure comprising: a hollow chamber, pump means supplying a treatment liquid into and out of said hollow chamber, means to supply air under pressure into said chamber, a first means to measure the pressure in said chamber, a second means to measure the temperature of the treatment liquid to provide a means to calculate the vapor pressure thereof and a control means operably associated with said apparatus to compare the measured pressure against the calculated vapor pressure of the liquid computed from the temperature measured by said second means and automatically actuate said air supply means to supply air under pressure into said chamber when the difference between the measured pressure and the calculated liquid vapor pressure is below a pre-determined pressure to prevent cavitation of said pump means and/or flashing of said treatment liquid.

4,538,433

WASHING MACHINE TUB HAVING INTEGRAL SHEET METAL BAND

Piero Durazzani, Pordenone, Italy, assignor to Industrie Zanussi S.p.A., Pordenone, Italy

Filed May 17, 1984, Ser. No. 611,163
Claims priority, application Italy, Jun. 22, 1983, 34032/83[U]
Int. Cl.³ D06F *37/22*
U.S. Cl. 68—140 **8 Claims**

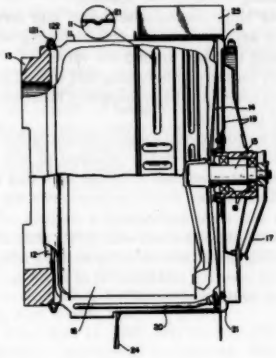
1. A substantially horizontally disposed washing machine tub, particularly for a household washing machine, said tub comprising:

a cylindrical shell having an open front end and an opposite end closed by a rear wall;

a cross member fixed to said rear wall and adapted to support a shaft of a basket to be revolvably positioned within said shell;

a sheet metal cylindrical band covering the outer surface of said shell over an axial length thereof less than the total axial length thereof, said band being in direct contiguous contact with said shell over said axial length of said band;

said band being integrally connected to the outer surface of said shell over said axial length of said band by a metal working operation; and



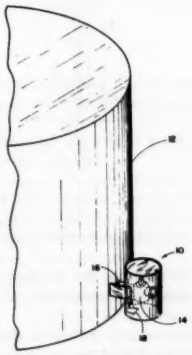
releasable attachment means for connecting said band to said cross member.

4,538,434

SECURITY HOUSING FOR OIL STORAGE TANK VALVE

James H. Janzen, Sr., 714 W. 71st St., and James H. Janzen, Jr., 716 W. 71st St., both of Tulsa, Okla. 74132

Filed Mar. 9, 1984, Ser. No. 587,495
Int. Cl.³ G05G *5/00*
U.S. Cl. 70—178 **6 Claims**



1. A security housing for locking a storage tank valve comprising:

(a) a first half housing adapted to surround and enclose one half of a valve attached to a storage tank, wherein said first half housing consists of an essentially rigid exterior surface and hollow concave interior terminating in an essentially planar perimeter that aligns with the perimeter of a second half housing;

(b) a second half housing adapted to surround and enclose the other half of a valve attached to a storage tank wherein said second half housing consists of an essentially rigid exterior surface and hollow concave interior terminating in an essentially palnar perimeter that aligns with the perimeter of said first half housing;

(c) a first hinge means attached to a portion of the perimeter of both first and second half housings such that said first and second half housings pivotally open and close about said hinge and reversibly surround said valve;

(d) at least one notched opening in said perimeter of said half housing/adapted to allow said half housing to close around said valve with the pipe leading from the storage tank to the valve passing through said opening;

(e) a second hinge means attached to said security housing essentially adjacent to said notched opening when said security housing is closed around the valve;

(f) a support means pivotally attached to said second hinged means and adapted to be permanently fastened to the storage tank near the valve;

(g) a pair of padlock eyelet means wherein each of said padlock eyelet means is individually attached to said perimeter of each of said separate half housings such that the eyelets of said padlock eyelet means project inwardly to said half housings and align and accept a padlock when said half housings are closed around said valve; and

(h) an opening within said security housing adapted to allow for manual insertion and removal of a padlock used to lock said safety housing.

4,538,435

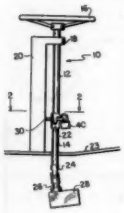
STEERING COLUMN LOCK FOR HEAVY-DUTY VEHICLES

Hector B. Romero, 1173 Socorro Ct., San Diego, Calif. 92129

Filed May 12, 1983, Ser. No. 493,935

Int. Cl.³ B60R *25/02;* **E05B** *65/12*

U.S. Cl. 70—183 **1 Claim**



1. A steering column lock assembly, comprising in combination:

a steering shaft mounted for rotation on closely adjacent support structure in a motor vehicle, said shaft having an openly accessible universal joint;

a one-piece substantially T-shaped element constructed of one-half inch hardened steel plate having a stem portion for insertion through an opening in the universal joint of said steering shaft and having a cross bar portion at one end of said stem portion, and a plurality of transverse bores extending through the end of said stem portion opposite the cross bar portion for selectively receiving heavy-duty padlock means; and

said heavy-duty padlock means including a padlock for inserting through a selected one of the bores in said stem portion after the stem portion is inserted through the opening of the universal joint to position the cross bar portion on the opposite side of the universal joint from the bores;

so that one of said cross bar portion and said stem portion interference with rotation of said shaft by any one of engagement with adjacent vehicle structure such as the steering column support, or engagement with pivoting universal joint structure to prevent pivoting of the universal joint for preventing rotation of the steering column.

4,538,436

PIPE BENDING MACHINE WITH BENDING MANDREL

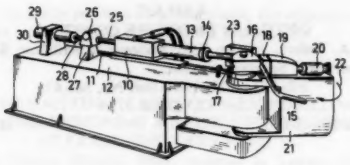
Rigobert Schwarze, Olpener Str. 460-474, 5000 Köln 91, Fed. Rep. of Germany

Filed Oct. 14, 1983, Ser. No. 542,068

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238264

Int. Cl.³ B21D *9/05*

U.S. Cl. 72—8 **19 Claims**



1. A pipe bending machine, comprising a travelling carriage provided with first clamping means; a bending template provided with second clamping means; a bending mandrel arranged in a pipe to be bent adjacent to said bending template, and having a mandrel rod having a rear end; means connected with said rear end of said mandrel rod for withdrawing said mandrel from said pipe; measuring means connected with said rear end of said mandrel rod for determining both the axial and rotary or torsion loading of said mandrel rod; and a switch element arranged to be actuated by said measuring means in the event that either the axial or torsion loading exceeds a predetermined value to at least stop either axial or torsional overloading of said mandrel for via said switch means.

4,538,437

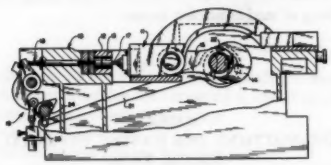
FORGING MACHINE KICKOUT DRIVE WITH RUNNING ADJUSTMENT

Robert E. Wisebaker, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Filed Jun. 25, 1984, Ser. No. 624,419

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—345 **14 Claims**



1. A kickout drive for forming machines having a frame comprising a drive cam journaled on said frame for oscillating rotation through a predetermined angle from a first position to a second position and providing a first cam surface, a kickout lever journaled on said frame and providing a second cam surface substantially adjacent to said drive cam, said kickout lever also providing an output portion operating a kickout in response to oscillation of said kickout lever, and adjustable drive means interconnecting said drive cam and said kickout lever and operating to oscillate said knockout lever in response to oscillation of said drive cam, said adjustable drive means including a connecting portion engaging both of said cam surfaces and positioning means fixed to said frame operable to adjust the position of said connecting portion with respect to said drive cam and kickout lever, said adjustment means operating to change the angle through said kickout lever oscillates in response to oscillation of said drive cam through said predetermined angle.

4,538,438

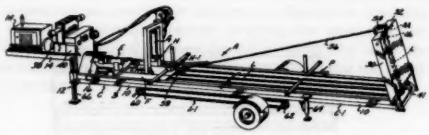
WATER CONSERVING ELONGATE TUBULAR METAL MEMBER STRAIGHTENING APPARATUS

Whestine B. Pridy, 2757 Cherry Ave., Long Beach, Calif. 90806

Filed Jul. 2, 1984, Ser. No. 626,928

Int. Cl.³ B21C *3/10, 43/00*

U.S. Cl. 72—39 **5 Claims**



1. A cooling and wash water conserving elongate tubular metal member straightening apparatus that includes:

a. an elongate rigid wheel supported, movable frame that includes a pair of parallel, laterally spaced side pieces and a forward cross piece, said frame having such weight distribution that extends to pivot downwardly and forwardly;

b. a frame extension that includes a pair of parallel, laterally spaced side piece extensions that have the major portions thereof situated rearwardly of said pair of side pieces, and a rearward cross piece secured to said pair of side piece extensions, said pair of side pieces having rearward ends and said pair of side piece extensions having forward ends;

c. a transverse shaft that extends through openings in said pair of side pieces and said pair of side pieces and side piece extensions adjacent said rearward and forward ends thereof for pivotally supporting said frame extension in a cantilevered position rearwardly from said frame;

d. forward and rearward rigid sheets situated below said frame and frame extension and secured thereto to cooperate therewith to define an elongate pan and pan extension, said forward and rearward sheets having adjacent transverse edges;

e. first means on said forward ends, rearward ends, and adjacent transverse edges for effecting a seal between said pan and pan extension when said pan extension is pivoted into substantially longitudinal alignment with said pan;

f. second means for adjusting said pan to a desired downwardly and forwardly extending position, said forward sheet having a water discharge opening therein adjacent said forward cross piece;

g. forward and rearward sprockets rotatably supported above said pan and pan extension adjacent said forward and rearward cross pieces;

h. an endless chain belt that engages said first and second sprockets and extends under said shaft, said chain belt including an upper reach;

i. a pump that includes a discharge outlet and an inlet in communication with said opening;

j. a carriage assembly longitudinally movable on said pair of side pieces and side piece extensions when the latter are longitudinally aligned with said pair of side pieces, said carriage assembly secured to said upper reach of said chain belt, with said carriage assembly including third means for sequentially subjecting longitudinal sections of an elongate tubular metal member to a transverse force when said elongate tubular metal member is longitudinally disposed above said frame and frame extension, said elongate metal member having forward and rearward ends;

k. rotatable water conducting coupling means adjacent said forward cross piece that removably engage said forward end of an elongate tubular metal member when the latter is disposed on said frame and frame extension;

l. power means for selectively rotating said coupling and an elongate tubular metal member in engagement therewith, longitudinally moving said carriage on said frame and frame extension relative to an elongate metal member to straighten the same, and drive said pump to discharge water through said coupling into said elongate tubular metal member to cool the same, with said water discharging through said rearward end thereof and thereafter flowing forwardly by gravity in said pan extension and pan to said discharge opening to be recirculated by said pump through an elongate tubular metal member in engagement with said coupling, with said frame extension, said second sprocket, and a portion of said chain belt rearwardly of said shaft when said straightening apparatus is not in use capable of being pivoted to an upwardly and forwardly extending position above said frame; and

m. fourth means for removably maintaining said frame extension above said frame.

4,538,439

CANS FORMED OF THIN-WALLED MATERIAL AND APPARATUS FOR FORMING PRECISE FINE BEADS THEREIN

Siegfried Frei, St. Gallen, Switzerland, assignor to Cantec, Incorporated, Fort Worth, Tex.

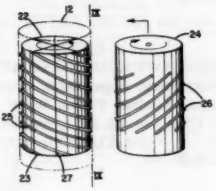
Filed Apr. 11, 1983, Ser. No. 483,652

Claims priority, application Switzerland, May 10, 1982, 2884/82; Feb. 18, 1983, 926/83

The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.

Int. Cl.³ B21D *51/26*

U.S. Cl. 72—105 **7 Claims**



1. An apparatus for producing fine precision beads in thin-walled cans having a can body made of sheet metal comprising:

an inner expansible tool capable of being positioned coaxially relative to the can body;

an outer tool arranged substantially axially parallel to said inner tool and capable of rolling upon a can body positioned upon said inner tool in a work position of said tools;

substantially parallel circumferential ribs provided at said inner tool and at said outer tool;

interruptions disposed at one or more locations of said circumferential ribs on at least one of said inner tool or said outer tool;

said interruptions extending substantially parallel to a lengthwise axis of the can body and being positioned above one another; and

said circumferential ribs on said inner tool engaging into intermediate spaces between said circumferential ribs on said outer tool in the work position of said tools in which said outer tool is capable of rolling upon the can body positioned upon said inner tool.

4,538,440

ROLL SWAGE DEVICE

Louis E. Kottke, Adrian, Mich., assignor to Acco Babcock Inc., Trumbull, Conn.

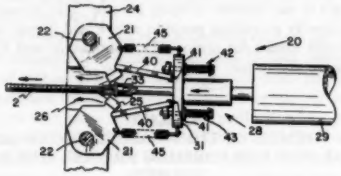
Continuation of Ser. No. 396,308, Jul. 8, 1982, abandoned. This application Jul. 24, 1984, Ser. No. 633,084

Int. Cl.³ B21D *19/10*

U.S. Cl. 72—189 **4 Claims**

1. A device for swaging an article having at least two opposed coplanar swaging tools forming a swaging station and where each tool is mounted for rotation about a fixed axis,

characterized in having pusher means including a piston movable in a hydraulic cylinder for moving said article towards said swaging station such that said article initially contacts said swaging tools at an entry side of said swaging station and such that continued movement of said pusher means forces said article completely through said swaging station whereby each said tool will be rotated about its fixed axis to form said article



and whereby said article will be ejected from an exit side of said swaging station, and return means for rotating said swaging tools to a point where they may again be engaged by an article, said return means including a return tension spring operatively positioned between each said swaging tool and said piston whereby the return tension springs will urge said swaging tools in a direction towards the entry side of said swaging station.

4,538,441

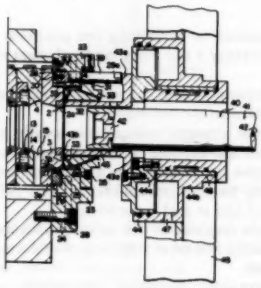
REDRAWING-IRONING APPARATUS

Horotaka Nishikawa, Sagamihara, Japan, assignor to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 619,969

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—349 **2 Claims**



1. A redrawing-ironing apparatus comprising a punch fixed on the nose of a ram; a die means including a redrawing die and a plurality of ironing dies for forming a can body from a drawn cup in a cooperative operation with the punch, a holding ring for the redrawing die and a plurality of holding rings for the ironing dies which are piled with a plurality of spacers therebetween; an annular piston for fastening the die means which is provided circumferentially to abut on the end surface of the redrawing die holding ring; a cup retainer pad adapted to push the inner periphery of the bottom of the drawn cup placed on the redrawing die; and a plurality and predetermined length of pins fixed on the annular piston and extending in the axial direction of the die means, wherein a free end surface of the pin is engaged with a flange of the cup retainer pad at the end of a redrawing process, thereby preventing a clearance between the redrawing die and the cup retainer pad from becoming less than a given value.

4,538,442

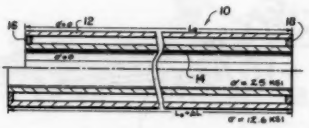
METHOD OF PRESTRESSING A TUBULAR APPARATUS

Stuart E. Reed, Homeworth, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 413,290, Aug. 31, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 619,396

Int. Cl.³ B21D *51/04*

U.S. Cl. 72—367 **6 Claims**



1. A method of prestressing tubular apparatus having at least one metal inner tubular and a metal outer tubular positioned coaxially around and spaced apart from and connected to the inner tubular at at least two spaced locations along the length thereof, comprising:

heating at least a portion of one of the inner and outer tubulars to a temperature sufficient for reducing the yield strength of said portion of said one of the inner and outer tubulars to a yield strength which is less than the yield strength of the other of the inner and outer tubulars;

while said tubulars are connected, stretching the inner an outer tubulars in a lengthwise direction by a selected amount which is beyond the yield point of said one tubular and which is not beyond the yield point of said other tubular; and

permitting said one of the inner and outer tubulars to cool while said tubulars are stretched whereby the double wall tube is prestressed and the inner and outer tubulars remain spaced from each other.

4,538,443

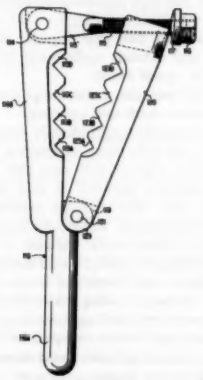
PORTABLE TOOL FOR AFFIXING TERMINALS ONTO BATTERY CABLES

Robert J. Gooding, Chester Springs, Pa., assignor to Action Concepts, Inc., Chester Springs, Pa.

Continuation-in-part of Ser. No. 402,099, Jul. 26, 1982, Pat. No. 4,445,358. This application Jan. 4, 1984, Ser. No. 568,134

Int. Cl.³ B21D *37/10*

U.S. Cl. 72—416 **10 Claims**



1. Portable tool for affixing a terminal onto an end of an electrical cable by swaging, comprising a handle member having a holding portion and a clamping portion, a clamping member pinned pivotally to the handle member, the respective

members having jaws adapted to swage a terminal therebetween upon pivoting closed, and clamping means carried by the handle member and adapted to engage the clamping member and to close the jaws forcibly enough to swage the terminal onto a cable inserted into a bore in the terminal.

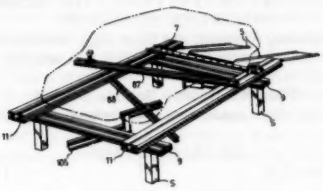
9. Method of affixing a replacement terminal by swaging onto an end of a battery cable installed in such a confined space as the engine compartment of a motor vehicle, comprising gripping the terminal between a pair of jaws adapted to be juxtaposed to one another in swaging configuration, inserting the cable end into the terminal, pivoting the jaws together sufficiently forcibly to swage the terminal tightly onto the cable end, and thereafter opening the jaws to release the terminal therefrom.

4,538,444

FRAME STRAIGHTENING DEVICE

Steve Yamada, 1022 Brimely Rd., Scarborough, Ontario, Canada M1P 3E9

Filed Sep. 17, 1984, Ser. No. 651,159
Int. Cl.³ B21D 1/14
U.S. Cl. 72—447 **20 Claims**



1. A structure for use in automotive collision repair comprising a support frame of peripheral support members, at least one work beam extending across and moveable transversely of opposing ones of said support members, work beam mounting means for mounting one end of said work beam to one of said support members with the other end of the work beam supported at the opposing support member such that said work beam is slideable relative to said support frame of said structure and adjustable to different working angles relative to said support members, a work beam adjustment for adjusting movement of said work beam transversely of the support members, and mounting means for mounting said work beam adjustment on said one of said support members in a manner such that said work beam adjustment is correspondingly slideable with said work beam along said structure, said work beam adjustment comprising a piston member for applying pressure on said work beam and said mounting means for said work beam adjustment comprising a saddle assembly slideable along said one of said support members and having a rotatable coupling for receiving said piston which is rotatable to different transverse angles with respect to said work beam.

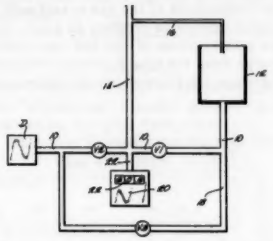
4,538,445

LIQUID FLOW METER

Frank W. Kenik, Wadsworth, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 9, 1983, Ser. No. 530,505
Int. Cl.³ G01F 25/00; G01M 19/00
U.S. Cl. 73—3 **8 Claims**

1. A meter for measuring liquid flow rates, said meter comprising a supply tank having a top and a bottom, conduit means connecting said tank to a point of use, a test standpipe including a lower end connected to said conduit means and an upper end open to the atmosphere and connected to said top of said supply tank, said standpipe having a uniform internal diameter and being adapted to contain a known quantity of liquid per unit of length, valve means in said conduit means operative to supply liquid to the point of use either from said tank or said standpipe for a test run and also operative to connect said standpipe to said tank to raise the liquid level in said standpipe



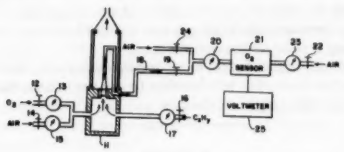
to that in said tank prior to a test run, and means for determining the liquid level in said standpipe at the start and end of a test run.

4,538,446

TECHNIQUE FOR MEASURING GAS CONVERSION FACTORS

Jag J. Singh, Yorktown, and Danny R. Sprinkle, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 23, 1984, Ser. No. 633,179
Int. Cl.³ G01F 1/70, 25/00
U.S. Cl. 73—3 **6 Claims**



1. A method for obtaining the hydrocarbon C_xH_y conversion factor for a flowmeter comprising the steps of:

forming a mixture of air, O_2 and C_xH_y with O_2 flowing into the mixture at a flowrate of m and with C_xH_y flowing into the mixture at a flowrate of n;

burning said mixture to form a product gas;

comparing the partial pressure of O_2 in the product gas with the partial pressure of O_2 in air;

measuring the flowrate of the C_xH_y flowing into said mixtures with said flowmeter; and

changing the flowrate of O_2 flowing into said mixture until said comparing step indicates that the partial pressures of O_2 in the product gas and air are equal;

whereby the reading on the dial of said flowmeter can be used for calculation of the conversion factor of said flow meter for the hydrocarbon C_xH_y.

4,538,447

METHOD AND APPARATUS USEFUL FOR RAPIDLY DETERMINING THE MOLECULAR WEIGHT OF A FLOWING GASEOUS MATERIAL

Milton F. Pravda, 7708 Greenview Ter., Towson, Md. 21204

Filed Mar. 13, 1984, Ser. No. 589,009
Int. Cl.³ G01N 31/00
U.S. Cl. 73—23 **10 Claims**

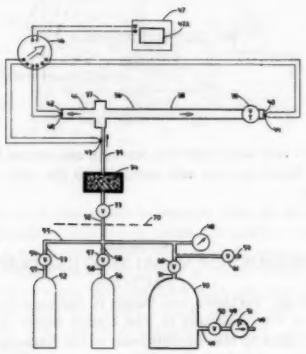
1. In a method of operating a vortex tube by feeding a gas under pressure to an inlet of the tube and expanding the same in a vortex generation chamber to form hot and cold fractions, and wherein said fractions are separately removed from the

tube, the improvement comprising determining the molecular weight of said gas by the aid of said tube and by means of the following steps:

pressurizing the inlet gas,

sensing the temperature of the gas in said inlet by means of a temperature sensor to produce an e.m.f., designated V_i,

sensing the temperatures of the hot and cold fractions as they emerge from the tube by means of temperature sensors to produce e.m.f.'s respectively designated V_h and V_c,



obtaining a first differential e.m.f. $V_h - V_i$, designated delta V_h that is representative of the temperature difference between the hot fraction and the inlet gas,

obtaining a second differential e.m.f. $V_i - V_c$, designated delta V_c, that is representative of the temperature difference between the inlet gas and the cold fraction,

forming a ratio of the delta V's,

and employing said ratio in a pre-established ratio-molecular weight converter relationship to convert the ratio to the molecular weight of the gas.

4,538,448

METHOD AND DEVICE FOR DETERMINING OF EXPLOSIVITY RATE OF GASEOUS MEDIUM

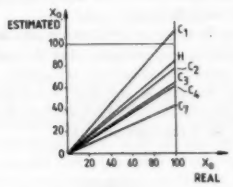
Maurice Boutonnat, Gouvieux, and Christian Marget, Verneuil-en-Halatte, both of France, assignors to Charbonnages de France, Paris, France

Filed Dec. 6, 1983, Ser. No. 558,734

Claims priority, application France, Dec. 14, 1982, 82 20925

Int. Cl.³ G01N *25/54*

U.S. Cl. 73—27 R **23 Claims**



1. A method of determining the explosivity rate of a gaseous medium containing at least one explosive gas, with a detecting filament which is heated in said medium by an electric current flowing therethrough, comprising the steps of:

igniting said detecting filament through connection thereof to a power supply,

regulating power supplied by said power supply to said detecting filament so as to maintain constant the resistance thereof,

taking into account, at some successive moments counted from the filament ignition time, the value U(t) of a quantity U which is significant for the power supplied to said detecting filament,

extrapolating from said values U(t) an exponential curve of equation

$$U(t) = \sum_{i=1}^{i=n} U_{o,i} \cdot \exp(-k_i \cdot t)$$

by identifying the parameters $U_{o,i}$ and k_i thereof, n being an integer greater or equal to unit k_i being a positive real exponent expressed in sec^{-1}, and

introducing parameters $U_{o,i}$ and k_i into a process function F, where the process function F is an empirically predetermined mathematical function with twice n parameters, which process function F is adapted to provide from these parameters an estimation of the initial explosivity rate of such gaseous medium independently of the nature of the explosive gas present in such gaseous medium.

4,538,449

PNEUMATIC MEASURING DEVICE FOR MEASURING WORKPIECE DIMENSION

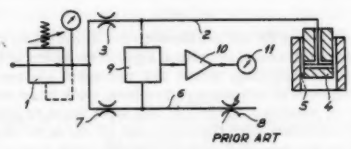
Heinz Wegmann, Rumlang, and Hans Sigg, Neuchatel, both of Switzerland, assignors to Meseltron S.A., Corcelles, Switzerland

Filed Nov. 7, 1983, Ser. No. 548,965

Claims priority, application Switzerland, Nov. 22, 1982, 67/6/82

Int. Cl.³ G01B *13/10*

U.S. Cl. 73—37.9 **11 Claims**



1. A pneumatic measuring device for measuring dimensions of a workpiece, said device comprising a pneumatic circuit containing a first branch having an inlet nozzle and at least one measuring nozzle and a second branch having an inlet nozzle being connected to a reference outlet nozzle, said first and second branches being connected to a pressure transducer delivering an electric signal representing the difference in pressures between said branches of the pneumatic circuit, a measuring spindle having a surface to which said at least one measuring nozzle is connected and means for connecting the inlet nozzles of said first and second branches to a regulated pressure source, said pressure transducer comprising a differential pressure transducer having a semiconductor element, said pneumatic circuit and said differential pressure transducer being integrally housed within said measuring spindle.

4,538,450

APPARATUS FOR TESTING CIGARETTES OR THE LIKE

Franz P. Koch, Schwarzenbek, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 421,564, Sep. 22, 1982, Pat. No. 4,471,650. This application Apr. 29, 1983, Ser. No. 489,731

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218163

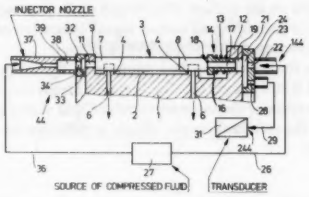
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

Int. Cl.³ G01N *15/08*; G01M *3/04*

U.S. Cl. 73—38 **17 Claims**

1. Apparatus for testing at a testing station the open-ended

tubular wrappers of cigarettes or analogous rod-shaped articles wherein the wrapper surrounds a filler of tobacco and/or filter material, comprising conveyor means arranged to transport a succession of articles toward, past and beyond the testing station; means for admitting a stream of gaseous testing fluid into at least one end of the wrapper forming part of the article advancing past the testing station with attendant establishment of a pressure differential between the interior and the exterior of the wrapper, including a source of gaseous testing fluid, conduit means for conveying a stream of testing fluid from said



source toward the testing station, and means for preventing oscillations of testing fluid in said conduit means as a result of abrupt admission and/or abrupt termination of admission of testing fluid into the wrappers of articles at the testing station, said oscillation preventing means comprising an injector nozzle in said conduit means and means defining a chamber which is adjacent to said nozzle, which communicates with the atmosphere and through which the testing fluid advances; and signal generating means for monitoring said pressure differential.

4,538,451

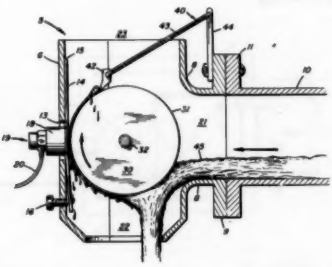
MACHINE FOR DETECTING SUGAR CRYSTALS IN MOLASSES

Stefan R. Reichard, Mackay, Australia, assignor to Sugar Research Limited, Queensland, Australia

Filed Mar. 9, 1984, Ser. No. 587,963

Int. Cl.³ G01N *15/00*

U.S. Cl. 73—61 R **9 Claims**



1. A device for detecting the presence of solid particles in a fluid including:

a housing having means defining an inlet for fluid and means defining an outlet for fluid;

fluid sampling means within the housing, for directing and conveying a sample of the fluid to a testing station within the housing, said testing station having a path defined within it, through which path the fluid sample can flow;

means for restricting the path through the testing station such that the fluid sample is caused to flow through the testing station and any solid particles in the fluid are crushed or tend to be crushed, thus causing movement or vibrations which may be detected by detection means;

detection means adjacent the testing station, for detecting said movement or vibrations caused by said crushing; and

output means operably coupled to said detection means, for providing a visual and/or audible indication of solid particles in the fluid.

4,538,452

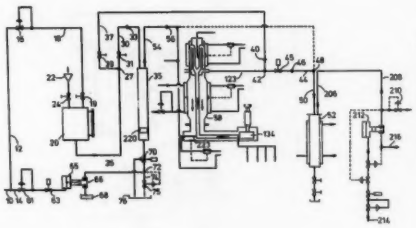
BORE-HOLE HYDRAULICS SIMULATOR

Ivan Hrvojic, Mississauga, Canada, assignor to Ontario Research Foundation, Sheridan Park, Canada

Filed Nov. 14, 1983, Ser. No. 551,343

Int. Cl.³ G01N *15/04*

U.S. Cl. 73—61.4 **30 Claims**



1. A bore hole hydraulics simulator for drilling fluid, comprising:

a permeable partition in the shape of an open-ended sleeve enclosing a first volume,

first means defining a second volume surrounding said sleeve, the second volume being adapted to receive filtrate passing across the permeable partition,

second means for flowing the drilling fluid axially through said sleeve,

third means for placing a pressure differential across the partition so as to promote the passage of filtrate into said second volume, and

fourth means for collecting the filtrate entering the second volume.

4,538,453

METHOD AND APPARATUS FOR DETERMINING THE MASS AND MOISTURE CONTENT OF TOBACCO

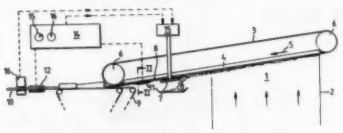
Albert Simmons, High Wycombe, England, assignor to Molins PLC, London, England

Filed Mar. 25, 1983, Ser. No. 478,665

Claims priority, application United Kingdom, Mar. 27, 1982, 8209062

Int. Cl.³ G01N *9/36;* B65B *1/30*

U.S. Cl. 73—73 **17 Claims**



1. A method of determining the mass and moisture content of tobacco, comprising passing said tobacco between a pair of capacitor plates forming a test capacitor; applying an alternating circuit input signal to said test capacitor at a varying frequency which changes rapidly over a range of frequencies including a frequency at which there is a resonance condition; monitoring a test signal which varies in amplitude in dependence upon the frequency of said input signal and exhibits said resonance condition; and producing outputs indicative of the

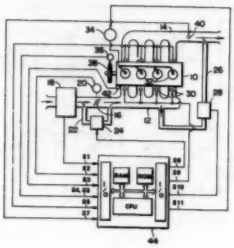
mass and moisture content of said tobacco derived from the resonance frequency and the magnitude of the test signal at a chosen frequency.

4,538,454

METHOD FOR DISCRIMINATING MOTOR/COMBUSTION PRESSURES IN AN I.C.E. COMBUSTION CHAMBER

Shigeo Aono, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 25, 1984, Ser. No. 573,762
Claims priority, application Japan, Jan. 26, 1983, 58-9929
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—115 **6 Claims**



1. In an internal combustion engine having a piston movably disposed in a combustion chamber and arranged to perform a compression stroke and a subsequent expansion stroke, a method of determining the motoring pressure characteristics in the combustion chamber due to the movement of said piston in the presence of combustion therein comprising the steps of:

arranging the ignition timing so that pressure due to combustion does not occur during the compression stroke;

recording the change in pressure in the combustion chamber which occurs with movement of said piston during said compression stroke; and

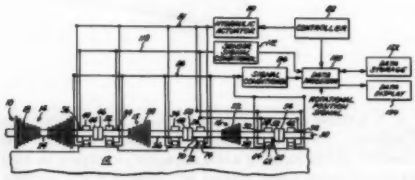
using the recorded data to derive the motoring pressure characteristics which occur during the expansion stroke and thus obtain the motoring pressure characteristics for said compression and expansion strokes irrespective of the presence of combustion pressure being produced during said expansion stroke.

4,538,455

METHOD AND APPARATUS FOR AXIALLY ALIGNING THE COUPLED SHAFTS OF A STEAM TURBINE

Oleg Klufas, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 27, 1984, Ser. No. 604,801
Int. Cl.³ G01M *19/00*
U.S. Cl. 73—118 **6 Claims**



1. An apparatus for axially aligning at least two axially coupled shafts of a steam turbine, each said shaft being rotatably supported by a pair of bearings above a turbine foundation, one of said bearings being disposed adjacent the axially outboard end of each said shaft, said apparatus comprising:

means for changing the elevation of the outboard end of each said shaft of said at least two axially coupled shafts, said means for changing the elevation being disposed between the respective bearing and said turbine foundation;

means for measuring the supporting force at each said bearing, said supporting force counteracting a portion of the weight of each said shaft;

a pair of strain gauges, one of said strain gauges being disposed on the surface of each said shaft, and each said strain gauge providing an output signal indicative of the degree of bending of the respective shaft; and

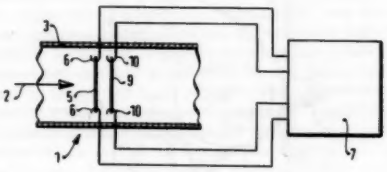
means for comparing and minimizing the output signals of said strain gauges by affecting said means for changing the elevation of the outboard ends of said shafts and comparing the resultant output signals at different levels of elevation.

4,538,456

METHOD AND APPARATUS FOR PREVENTING DAMAGE BY OVERHEATING TO AN AIR FLOW RATE METER RESISTOR

Heinz Gneiss, Ludwigsburg, and Werner Wünsch, Markgroningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,762
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1982, 3227807
Int. Cl.³ G01F *1/68*
U.S. Cl. 73—204 **4 Claims**



1. A method for preventing damage to a temperature-dependent resistor of an air flow rate meter disposed in a flow cross section caused by overheating as a result of the ignition of a combustible, gaseous mixture during a burn-off procedure for burning off deposits from the surface of said temperature-dependent resistor, comprising the steps of:

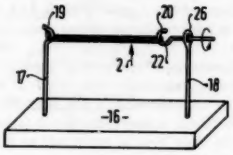
disposing a heating resistor in the vicinity of said temperature-dependent resistor;

applying a heating current to said heating resistor after the termination of the measuring operation of the temperature-dependent resistor at specific engine conditions to a temperature at which any combustible gases located in its vicinity ignite and burn, and subsequently heating said temperature-dependent resistor to its burn-off temperature.

4,538,457
APPARATUS FOR MEASURING THE MASS OF A FLOWING MEDIUM

Heinz Gneiss, Ludwigsburg, and Jaihind S. Sumal, Vaihingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,857
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1983, 3303885
Int. Cl.³ G01F *1/68*
U.S. Cl. 73—204 4 Claims



1. An apparatus for measuring the mass of a flowing medium, especially for measuring the amount of aspirated air in internal combustion engines, having an electronic regulating circuit and a temperature-dependent measuring resistor in the form of a hot wire placed in said medium flow, comprising

supports having hook-shaped ends for supporting respective ends of said hot wire in an electrically conducting manner,

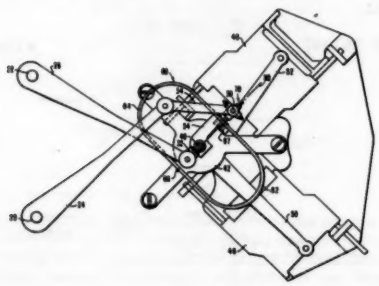
said hot wire being covered with an electrically insulating layer, said hot wire being disposed between said supports and looped between said hook-shaped ends into at least one coil around said supports, and

said hook-shaped ends include guide means for bundling said hot wire coil closely together.

4,538,458
TEMPERATURE COMPENSATED GAS METERS

Daniel E. Bruce, Turtle Creek, and John L. Esola, Falls Creek, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1983, Ser. No. 526,733
Int. Cl.³ G01F *3/22, 15/04*
U.S. Cl. 73—233 8 Claims

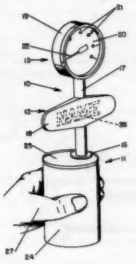


1. A temperature compensated gas meter having displacement members adapted to be displaced by the flow of gas through said meter, a rotatable drive shaft drive connected to a meter register, a tangent post mounted for orbital movement about the axis of said drive shaft, said displacement members being drive connected by motion transmitting linkage to said tangent post to drive said tangent post in orbital movement around the axis of said drive shaft, temperature responsive means for varying the radius of movement of said tangent post about the axis of said drive shaft in accordance with variations in the temperature of the gas comprised of at least two serially connected bimetal elements extending between said tangent post and said drive shaft, said bimetal elements being oriented whereby each element responds to a given temperature change to produce movement in the same direction as the other with respect to the axis of said shaft.

4,538,459
DRINK CAN MEASURING AND CAN CRUSHING DEVICE

John G. Vandenbergh, 3424 Huckabay Cir., Raleigh, N.C. 27612

Filed Jul. 25, 1983, Ser. No. 516,656
Int. Cl.³ G01L *5/02*
U.S. Cl. 73—379 9 Claims

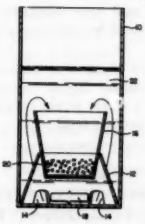


1. The method of measuring muscular strength while reducing the size of can type containers prior to disposal thereof comprising: opening said can; emptying at least a portion of the contents of said can; sealingly placing a portion of an air pressure measuring means having a pressure indicator in said opening; squeezing said can to at least partially collapse the same so as to cause air inside said can to communicate into said air pressure measuring means; and removing said measuring means from said can whereby the same will be in a compact condition when disposed of.

4,538,460
METHOD FOR DETERMINING PERMEABILITY

Paul D. Schettler, Jr., Huntingdon, Pa., assignor to Columbia Gas System Service Corporation, Columbus, Ohio

Filed Apr. 30, 1984, Ser. No. 605,121
Int. Cl.³ G01N *15/08*
U.S. Cl. 73—432 R 13 Claims



1. A method for determining the permeability of a sample, said method comprising:

contacting said sample with a dye solution for a dyeing period sufficient to permit dye from said dye solution to diffuse into said sample;

separating said sample from said dye solution and rinsing remaining dye solution from the surface of said sample; and

placing said rinsed sample in a leachback liquid for a leach-

back period sufficient to permit said dye from said rinsed sample to diffuse into said leachback liquid; and

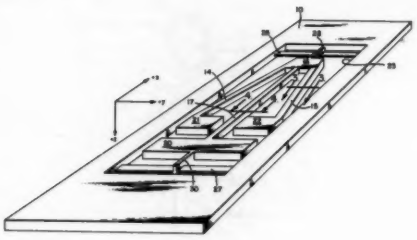
measuring the amount of said dye which has diffused from said rinsed sample into said leachback liquid.

4,538,461

VIBRATORY ANGULAR RATE SENSING SYSTEM

William F. Juptner, Laguna Beach; David F. Macy, Mission Viejo, and Juergen H. Staudte, Anaheim, all of Calif., assignors to Piezoelectric Technology Investors, Inc., Laguna Hills, Calif.

Filed Jan. 23, 1984, Ser. No. 572,782
Int. Cl.³ G01P *9/04*
U.S. Cl. 73—505 **9 Claims**



1. A vibratory angular rate sensing system comprising:

(a) a wafer of crystalline quartz having piezoelectric properties and forming a substantially rectangular mounting frame and having a substantially rectangular central opening;

(b) a pair of tines extending at a predetermined acute angle within said opening;

(c) a base interconnecting said tines near their origin;

(d) a first and a second suspension bridge, each being secured at its ends to said mounting frame;

(e) a pivot extending between the axis of symmetry of said tines and through said base, said pivot being secured near both ends by said suspension bridges;

(f) a reaction mass secured to said pivot at its end extending beyond the wide opening of said tines;

(g) a pair of masses, each being secured to the free end of one of said tines, said tines having large fundamental and small harmonic thrust components, and said pair of masses being each disposed with the center of mass offset from the axis of the associated tine, whereby the centers of each mass move in arcs having substantially no thrust component;

(h) means including a first pair of electrodes secured to said tines for driving said tines substantially at their resonant frequency determined by said pair of masses, said tines and said base; and

(i) a second pair of electrodes secured to said pivot for picking up an output signal representative of torsion which produces a shear strain resulting in an amplitude variation of the electric field.

4,538,462

ADHESIVE BOND INTEGRITY EVALUATION METHOD

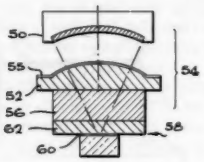
Jan J. Hartog; Jack L. Bellin; Gilbert C. Knollman, and Arthur D. Jonath, all of Palo Alto, Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Dec. 12, 1983, Ser. No. 560,639
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—577 **11 Claims**

1. A method of determining whether adhesively bonded joints between two structural elements have acceptable strength levels comprising the steps of:

determining by test the levels of acoustic energy to be directed to a minute area of the adhesively bonded joint and the application times of said directed acoustic energy, said combinations of directed acoustic energy and application time selected to macroscopically stress and/or strain-to-failure said minute area of the adhesively bonded joints having minimum acceptable bond strength or less;

directing said acoustic energy on said minute area of the adhesively bonded joint and steadily increasing said directed acoustic energy/time up to the selected combination which would macroscopically stress and/or strain-to-



failure said minute area of the adhesively bonded joint were it of less than minimum acceptable bond strength;

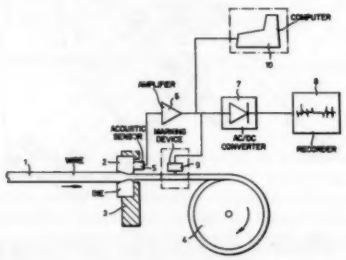
monitoring the interaction of said directed acoustic energy with said minute area of the adhesively bonded joint and/or the acoustic emission therefrom, a sudden change in said monitored acoustic interaction and/or emission, while the said directed acoustic energy is being steadily increased, indicating bond unacceptability.

4,538,463

FLAW DETECTION IN WIRE DRAWING

Nicolas C. Pease, Bishop Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 15, 1984, Ser. No. 589,971
Claims priority, application United Kingdom, Mar. 16, 1983, 8307242
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—587 **9 Claims**



1. A method of detecting the presence of flaws in a wire as it passes through a wire drawing die, comprising the steps of

sensing acoustic waves issued during the passage of the wire through the die, at least in the megacycle range, and generating an electrical signal representative of such acoustic waves; and

monitoring the electrical signal for the occurrence of transient events therein.

4,538,464
METHOD OF MEASURING REACTIVE ACOUSTIC POWER DENSITY IN A FLUID

John C. Wheatley; Gregory W. Swift, both of Los Alamos, and Albert Migliori, Santa Fe, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 4, 1983, Ser. No. 539,013
Int. Cl.³ G01N 9/00
U.S. Cl. 73—646 1 Claim

1. A method for determining the reactive acoustic power density level in a fluid, comprising the steps of:

positioning in said fluid at least one thermally conductive plate having substantially parallel edges at opposite ends thereof:

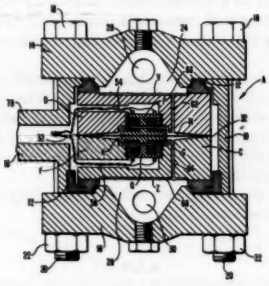
orienting said plate so as to obtain a maximum difference in temperature between said substantially parallel edges of said plate, whereby said plate is oriented so that the direction of acoustic reciprocal motion in said fluid is substantially parallel to the plane of said plate and substantially transverse to said parallel edges of said plate:

measuring the temperature difference between said parallel edges of said plate, whereby the level of reactive acoustic power density in said fluid may be determined by correlation with said temperature difference.

4,538,465
ELECTRONIC TRANSMITTER FOR TRANSMITTING PRESSURE VALUES OF INDUSTRIAL PROCESS FLUIDS

Gianfranco Bianchi, San Fermo Della Battaglia; Piero Pierpaoli, Lenno; Riccardo Borelli, Tremezzo, and Luciano Rainoldi, Lenno, all of Italy, assignors to Kent-Tieghi S.p.A., Lenno, Italy

Filed Jul. 2, 1982, Ser. No. 394,894
Claims priority, application Italy, Jul. 29, 1981, 23219 A/81
Int. Cl.³ G01L 9/10
U.S. Cl. 73—722 12 Claims

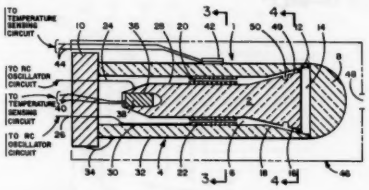


1. An electronic transmitter for transmitting pressure values of fluids used in industrial processes, said transmitter formed of a housing having a measuring diaphragm fastened thereto and defining therewith a chamber, said chamber and diaphragm being subjected to the pressure of the process fluid, magnetic cores facing the measuring diaphragm for inducing a magnetic field, said cores having an inductance which changes in correspondance with air gap changes which occur between the measuring diaphragm and the magnetic cores due to movement of the measuring diaphragm, said inductance changes being processed in an electronic circuit for indicating the pressure value acting at that time on the measuring diaphragm, wherein said measuring diaphragm is provided with a rigid center which is either formed of or carries at least one element of a material exhibiting a high magnetic permeability, said rigid center facing said magnetic cores and moving in an exact parallel relationship with the plane in which said magnetic cores lie so that the inductance changes occur in accordance with a predetermined and reproducible law.

4,538,466
CAPACITANCE PRESSURE TRANSDUCER AND METHOD OF FABRICATION THEREFOR

George L. Kerber, 4611 Lisann St., San Diego, Calif. 92117

Filed Feb. 6, 1984, Ser. No. 577,166
Int. Cl.³ G01L 9/12; H01G 7/00
U.S. Cl. 73—724 21 Claims

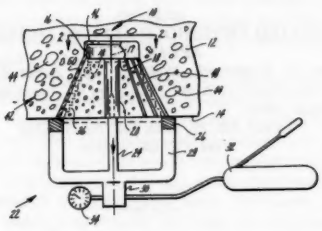


1. A capacitance pressure transducer comprising cylindrical inner and outer members separated from one another by a gap, the size of which gap is adapted to change as a function of pressure, and electrode means located at said inner and outer members and responsive to the size of said gap for providing an indication of pressured, respective first ends of said inner and outer members connected to one another at a joint formed therebetween such that the second end of said inner member is cantilevered from said joint and suspended within said outer member.

4,538,467
METHOD AND APPARATUS FOR MEASURING THE STRENGTH OF HARDENED CONCRETE

Ulrich W. Stoll, 2121 Hall, Ann Arbor, Mich. 48104

Filed Jan. 6, 1984, Ser. No. 568,863
Int. Cl.³ G01N 33/38
U.S. Cl. 73—803 3 Claims



1. An apparatus for determining the compressive strength of hardened concrete, a test member adapted to be enveloped in concrete in the plastic state, said test member having a bearing surface engageable with the concrete after hardening, means operatively associated with said test member capable of moving said bearing surface with sufficient force to cause fracture of said hardened concrete, the improvement comprising a shield member operatively associated with said test member so as to restrict the passage of larger particles of aggregate in said plastic concrete into positions in proximity to said bearing surface so as to affect the fracture of said hardened concrete, said test member being generally cyclindrical in shape and having an axis bearing surface generally perpendicular to said axis, and wherein said means for moving said bearing surface is operable to move said bearing surface in a direction generally parallel to said axis, said shield member comprising a mounting

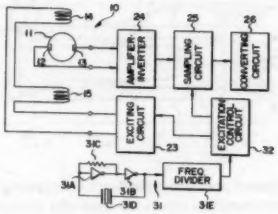
section supported on said test member and finger members positioned around said bearing surface and extending away therefrom in a generally deverging arrangement.

4,538,468

ELECTROMAGNETIC FLOWMETER

Toyofumi Tomita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 15, 1984, Ser. No. 589,719
Claims priority, application Japan, Mar. 23, 1983, 58-48132
Int. Cl.³ G01F *1/60*
U.S. Cl. 73—861.17 **7 Claims**



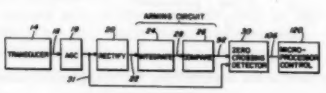
1. An electromagnetic flowmeter comprising:
flow rate detecting means for detecting the flow rate of a conductive fluid;
exciting means for supplying an exciting current to said flow rate detecting means in response to an excitation control signal;
signal processing means for sampling an output signal from said flow rate detecting means in response to a sampling signal and for smoothing this sampled signal; and
signal generating means for supplying a sampling signal to said signal processing means and an excitation control signal to said exciting means, said sampling signal having a frequency different from the commercial power frequency by 0.5 to 10%, said excitation control signal having a frequency which is an even fraction of the frequency of said sampling signal.

4,538,469

INTEGRATED THRESHOLD ARMING METHOD AND APPARATUS

Lawrence C. Lynnworth, Waltham, and James E. Matson, Brookline, both of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Filed Jul. 29, 1983, Ser. No. 518,344
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.27 **17 Claims**



1. Intervalometer apparatus for determining the arrival time of a bandwidth limited energy pulse comprising
pulse receiving means responsive to said pulse for generating an electrical receive signal representing the undulations of the pulse,
arming means responsive to said receive signal for generating an arming electrical signal representative of an armed condition, said arming means comprising
a signal integrator responsive to said receive signal for generating said arming signal when an integrated value, dependent upon said receive signal for a said energy pulse, crosses a threshold value, and
event recognition means responsive to said arming signal and said receiving signal for detecting an event occurring in said receive signal during said armed condition, said event determining the arrival time of said bandwidth limited pulse.

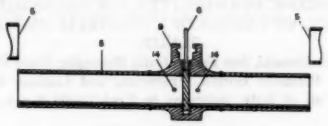
10. A method for determining the arrival time of a bandwidth limited energy pulse comprising the steps of:
generating, in response to said pulse, an electrical receive signal representing the undulations of the pulse,
generating, in response to the receive signal, an arming electrical signal representative of an armed condition, said second generating step comprising the step of integrating the receive signal for generating the arming signal when an integrated value, dependent upon the receive signal, crosses a threshold value, and
detecting, in response to said arming signal, at a time when said arming signal represents the armed condition, an event occurrin$_b$ in the receive signal during the armed condition, the event determining the arrival time of the bandwidth limited pulse.

4,538,470

FLOW METERING TUBE INSERT AND METHOD

Clarence G. Snell, P.O. Box 129, Aztec, N. Mex. 87410

Filed Apr. 22, 1983, Ser. No. 487,738
Int. Cl.³ G01F *1/42*
U.S. Cl. 73—861.61 **9 Claims**



1. A method of modifying an orifice plate-type fluid metering station to establish a desired Beta Ratio while maintaining a desired pressure drop across the orifice plate, comprising:
selecting and removing from service an existing metering tube run of a first internal diameter and including an orifice fitting with removable orifice plate holding means;
replacing the orifice plate holding means with a spacing means;
securing first and second inserts of a second internal diameter which is smaller than said first diameter in said tube run so as to abut opposite sides of said spacing means;
forming a pressure tap hole in each of said inserts;
installing differential pressure tap pipes in said tap holes;
removing said spacing means; and
installing the orifice plate holding means and an orifice plate of desired size.

4,538,471

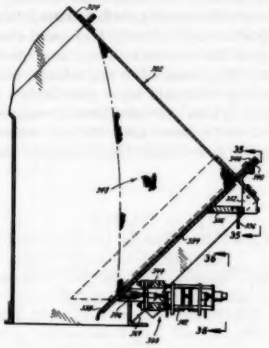
IMPULSE MOMENTUM DRY FLOW SENSOR WITH LINEAR FORCE TRANSDUCER AND SUSPENSION THEREFOR

Joseph A. Volk, Jr., Florissant, and Joseph A. Volk, Chesterfield, both of Mo., assignors to Beta II, Incorporated, St. Louis, Mo.

Continuation-in-part of Ser. No. 479,252, Mar. 28, 1983,. This application Dec. 12, 1983, Ser. No. 560,187
Int. Cl.³ G01F *1/30*
U.S. Cl. 73—861.73 **57 Claims**

1. In a conduit through which granular materials flow, said conduit having a first input portion aligned in other than a vertical orientation, a second output portion aligned at an angle to the first portion, and a conduit turn connecting said first and second portions, means for measuring the flow rate of the granular material through the turn, the flow rate measuring means comprising:
a surface,
means mounting said surface in said conduit turn at an angle

with respect to both horizontal and vertical so that material flowing through said turn impacts said surface or granular material accumulated on said surface, said granular material tending to build up on said surface as it traverses the turn so that the turning force of the granular



material is transmitted through said material build up to said surface as it flows through the turn, and

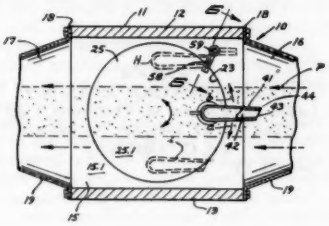
means connected to the surface to measure the force transmitted thereto by the granular material, said force being substantially the impulse force thereof and directly related to the flow rate of said granular material.

4,538,472

PNEUMATIC CROSSCUT SAMPLER

Harold Skarpness, Minneapolis, Minn., assignor to Gustafson, Inc., Dallas, Tex.

Filed Jul. 29, 1983, Ser. No. 518,646
Int. Cl.³ G01N *1/20*
U.S. Cl. 73—863.55 **18 Claims**



1. A crosscut sampler for particulate material flowing under pneumatic pressure in a duct comprising,

a housing for connection into the duct and having an inlet and an outlet and a flow passage therebetween for the stream of flowing material, the housing having a wall with an inner face lying along the flow passage and also having a circular opening therein,

a sample head in the housing and having a slotted sample receiving side facing upstream and traversing the flow passage for collecting samples of the flowing material, and

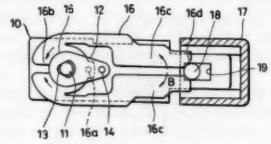
a circular mounting disc in the circular wall opening and having means mounting the head for moving the slotted side transversely across the flow passage and the stream of flowing material, the disc having an inner face lying flush with the inner face of the housing wall, and seal means between the periphery of the disc and the housing wall.

4,538,473

CROSS-ARM MECHANISM IN A PUSHBUTTON TUNER

Takao Kanai, and Takao Chaki, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,866
Claims priority, application Japan, Dec. 11, 1981, 56-198469
Int. Cl.³ F16H *35/18*; H03J *5/06*
U.S. Cl. 74—10.33 **3 Claims**



1. A cross arm mechanism in a pushbutton tuner, comprising:

an elongated cross arm having a front end and a proximal end;

a setting plate disposed on top of and extending longitudinally with respect to said cross arm, a setting pin and a shaft bore located close to said front end of said cross arm, one of said setting pin and said shaft bore being provided on said setting plate and the other thereof being provided on said cross arm, said shaft bore having opposed walls which taper in a direction toward said front end of said cross arm so that said walls define a substantially V-shaped portion of said bore, said setting pin projecting into said shaft bore so that said setting plate is mounted for pivotal movement with respect to said cross arm and said setting pin is disposed between and is adapted to contact said opposed walls, said setting plate having an urging protuberance extending upwardly therefrom at the end thereof that is located toward said proximal end of said cross arm, said protuberance being adapted to engage a memory slide of the tuner;

a pushbutton mounted on said proximal end of said cross arm and supported for longitudinal movement thereon between inner and outer position, and a locking member provided within said pushbutton;

a plate spring having a substantially C-shaped tightening portion which opens toward said front end of said cross arm and a pair of elastically deflectable lever arms on opposite lateral sides of said tightening portion and extending therefrom in a direction longitudinally of said cross arm toward said pushbutton, said lever arms defining a slot therebetween and being adapted to be deflected away from each other to receive said locking member therebetween when said pushbutton is in said inner position, said C-shaped tightening portion partially surrounding a portion of said setting plate and being distortable into clamping engagement with said setting plate when said lever arms are deflected away from each other, said locking member being received between said lever arms when said pushbutton is in said inner position so that said C-shaped tightening portion is distorted into clamping engagement with said setting plate when said pushbutton is in said inner position, said locking member being disposed outwardly of said slot when said pushbutton is in said outer position so that said C-shaped tightening portion is in non-clamping engagement with said setting plate when said pushbutton is in said outer position;

and support means defining a support point for mounting said plate spring on said cross arm, said support point being located nearer to said proximal end of said cross arm than said setting pin.

4,538,474

IMPULSE VARIABLE SPEED DEVICE

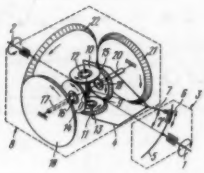
Vladimir F. Dzjuba; Vladlen L. Besedin, and Boris N. Birjukov, all of Odessa, U.S.S.R., assignors to Odessky Politekhnichesky Institut, U.S.S.R.

PCT No. PCT/SU80/00160, § 371 Date May 13, 1982, § 102(e) Date May 13, 1982, PCT Pub. No. WO82/01231, PCT Pub. Date Apr. 15, 1982

PCT Filed Sep. 25, 1980, Ser. No. 380,746

Int. Cl.³ F16H *21/12, 21/48, 29/00, 29/04*

U.S. Cl. 74—63 **5 Claims**



1. An impulse variable speed device comprising coaxially arranged input and output shafts, a first mechanism converting rotary motion of the input shaft into oscillating motion of an intermediate link and kinematically connected to said input shaft, and a second mechanism converting the oscillating motion of the intermediate link into rotary motion of the output shaft and having free-wheeling clutches kinematically connected with said intermediate link, wherein the improvement comprises (a) the first mechanism comprising (1) a bow-shaped guide rod fixed on the input shaft and having a center of curvature on the axis of the input and output shafts, which center is a single center of the variable speed device; (2) a slider put on said guide rod for displacement along said guide rod; and (3) a lever whose axis crosses the single center of the variable speed device, one end of said lever being pivoted to the slider and another end of said lever being fixed on the intermediate link; (b) said intermediate link comprising a carrier capable of rocking with respect to the single center of the variable speed device; and (c) said second mechanism comprising a converter having a single center, which coincides with the single center of the variable speed device; wherein the converter comprises a bevel gear having two differential pinions mounted on the carrier through free-wheeling clutches of a heterodirectional action constantly in mesh with said differential pinions, two central wheels each of which is mounted on the end of a respective half-axle through a respective free-wheeling clutch, said half-axles of the central wheels being coaxial and their axis being perpendicular to the axis of the input and output shafts, on the opposite end of each said half-axles there is secured a bevel wheel constantly in mesh with a bevel wheel secured on the output shaft, the axes of the differential pinions, the central wheels, and the three bevel wheels being perpendicular to each other and intersecting at the center of the converter.

4,538,475

SPEED-CHANGING TRANSMISSION DEVICE FOR VEHICLES

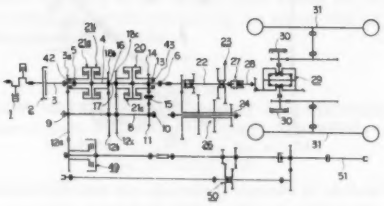
Takashi Igarashi; Nakashiro Mukai, and Haruki Otsuki, all of Matsuyama, Japan, assignors to Iseki & Co., Ltd., Matsuyama, Japan

Continuation of Ser. No. 252,845, Apr. 10, 1981, abandoned. This application Aug. 18, 1983, Ser. No. 524,322

Int. Cl.³ F16H *3/08*

U.S. Cl. 74—368 **5 Claims**

1. A speed-changing transmission device for vehicles to impart an engine braking effect on a vehicle in the parked position thereof comprising an engine crankshaft (1) and input shaft (3), a main clutch interposed between said crankshaft (1) and said input shaft (3), a speed-changing shaft (4) for transmitting driving power to the driving wheels of the vehicle, said speed-change shaft (4), being coaxially disposed with said input shaft (3), a counter shaft (8) mounted in parallel with said speed-changing shaft (4), an input gear, a one-way clutch 42 coupling said input gear to said speed-changing shaft 4, said one-way clutch including an outer wheel 42*a* fitted to the input gear (3*a*), and an inner wheel 42*b* fitting the speed-changing shaft which rotates in the same direction as the input shaft in the forward speed of the input shaft whereby the input gear 3(*a*) and the speed-changing shaft 4 rotate freely of each other in a drive position and whereby said speed-changing shaft (4) and input gear 3(*a*) rotate as a unit in a parked position, a counter gear 12*a* connected to said counter shaft (8) disposed always meshing with said input gear 3(*a*), a forward speed charging gear system provided between said speed changing shaft (4) and said counter shaft (8), and including a forward speed-changing gear (18(*b*), 18(*c*) rotatably mounted on said



speed-changing shaft 4 and a forward counter meshing gear 12(*b*), 12(*c*) connected to said counter shaft (8) meshing with each other so as to transmit the rotation of said counter shaft (8) to said speed-change shaft at a reduced speed as compared to the speed of the input shaft or in the reverse direction to the direction of rotation of said input shaft (3), a backward speed-changing gear system provided between said speed-changing shaft (4) and said counter shaft (8), said backward speed-changing system including a backward speed-changing gear (14) on said speed-change shaft 4, a backward idler gear (15), and a backward counter gear 11 on said counter shaft (8), clutch means disposed in the power transmission path formed by the respective forward and backward changing gear systems adapted to be selectively operated, and a backward one-way clutch 43 cooperatively associated with said backward gear system.

4,538,476

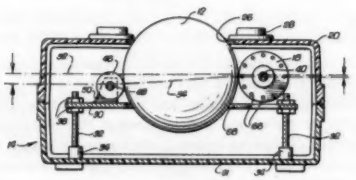
CURSOR CONTROL ASSEMBLY

Tom. R. Luque, 22000 Romar St., Chatsworth, Calif. 91311

Filed May 12, 1983, Ser. No. 493,823

Int. Cl.³ G05G *9/04*

U.S. Cl. 74—471 XY **8 Claims**



1. A ball-type cursor control assembly for controlling the position of a cursor within the field of a video display, comprising:

a control ball;

a support platform;

a pair of traction wheels rotatably supported by said support platform at orthogonally spaced positions for contacting and supporting said control ball;

a rolling bearing rotatably supported by said support platform for contacting and supporting said control ball at a side thereof generally opposite said traction wheels and generally equidistant between said traction wheels;

said traction wheels being positioned to contact said control ball at two respective contact points substantially at the horizontal equator of said control ball and said rolling bearing being positioned to contact said control ball at a third contact point substantially below said ball equator whereby said contact points lie in a common plane canted relative to said ball equator and passing below the center of the ball and wherein said contact points lie on a radius substantially less than the radius of said control ball; and

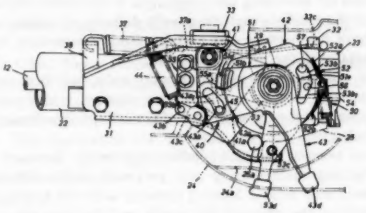
means responsive to rotation of said traction wheels for controlling the position of said cursor within the field of the video display.

4,538,477

TILTABLE STEERING SHAFT ASSEMBLY FOR AUTOMOTIVE VEHICLES

Toshiro Kurusu, and Hakumi Ishii, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 21, 1984, Ser. No. 591,962
Claims priority, application Japan, Mar. 30, 1983, 58-56347
Int. Cl.³ B62D 1/18
U.S. Cl. 74—493 **4 Claims**



1. A fastening device for a tiltable steering shaft assembly including a steering shaft tiltably connected to steering gear means in an automotive vehicle and mounted thereon with a steering wheel, and a tubular housing having said steering shaft journalled therein, said fastening device comprising:

a stationary bracket mounted on a portion of the vehicle body structure for supporting said shaft assembly in place at a predetermined angle;

a movable bracket secured to said tubular housing and pivoted to said stationary bracket for angular adjustment of said steering wheel in a vertical direction, said movable bracket being provided at a free end thereof with a toothed portion in the form of a sector gear;

a latch member pivoted to a side portion of said stationary bracket and movable between a locked position in which said latch member is in engagement with the toothed portion of said movable bracket to lock said steering wheel in a selected angular position and an unlocked position in which said latch member disengages from the toothed portion of said movable bracket to permit free movement of said movable bracket;

a first manual lever pivoted to said stationary bracket and movable perpendicularly with respect to the pivot axis;

an engaging element provided on said first manual lever and in engagement with said latch member for maintaining it in the locked position when said first manual lever is in a released position and for permitting movement of said latch member to the unlocked position when said first manual lever is operated to a predetermined angular position from its released position;

first resilient means for biasing said first manual lever toward its released position;

second resilient means for biasing said steering wheel into a remote position upwardly with respect to the selected angular position; and

first cam means cooperable with said first manual lever for effecting movement of said latch member to the unlocked position in response to operation of said first manual lever to the predetermined angular position and for permitting movement of said latch member to the locked position in response to release of said first manual lever;

a movable plate mounted on the pivot axis and movable perpendicularly with respect to the pivot axis, said movable plate being integrally formed at one end thereof with a receiver portion which is releasably in engagement with the toothed portion of said movable bracket to determine the locked position of said latch member and to receive thereon said latch member when located in its unlocked position;

third resilient means for biasing said movable plate toward the toothed portion of said movable bracket;

a second manual lever pivoted to said stationary bracket and movable perpendicularly with respect to the pivot axis, said second manual lever being arranged to be engaged with said first manual lever when operated toward said first manual lever over a predetermined angle;

fourth resilient means for biasing said second manual lever toward a released position spaced from the released position of said first manual lever;

stopper means for receiving said second manual lever by engagement therewith to maintain it in its released position;

second cam means cooperable with said second manual lever for disengaging the receiver portion of said movable plate from the toothed portion of said movable bracket in response to operation of said second manual lever toward the first manual lever and for engaging the receiver portion of said movable plate with the toothed portion of said movable bracket in response to release of said second manual lever; and

retainer means for retaining the receiver portion of said movable plate by engagement therewith in its disengaged position;

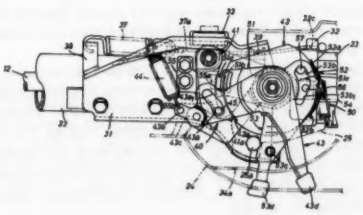
wherein said movable bracket further is provided with a lateral projection which is arranged to be abutted against an end face of said movable plate when relative angular movement between said movable bracket and said movable plate caused by an error in operation of said second manual lever reaches a predetermined angle.

4,538,478

TILTABLE STEERING SHAFT ASSEMBLY FOR AUTOMOTIVE VEHICLES

Hiroki Sato; Shuhei Toyoda; Yuji Yokoya, and Hakumi Ishii, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 21, 1984, Ser. No. 591,807
Claims priority, application Japan, Mar. 29, 1983, 58-52897
Int. Cl.³ B62D 1/18
U.S. Cl. 74—493 **8 Claims**



1. A fastening device for a tiltable steering shaft assembly including a steering shaft tiltably connected to steering gear

means in an automotive vehicle and mounted thereon with a steering wheel, and a tubular housing having said steering shaft journalled therein, said fastening device comprising:

a stationary bracket mounted on a portion of the vehicle body structure for supporting said shaft assembly in place at a predetermined angle;

a movable bracket secured to said tubular housing and pivoted to said stationary bracket for angular adjustment of said steering wheel in a vertical direction, said movable bracket being provided at a free end thereof with a toothed portion in the form of a sector gear;

a latch member pivoted to a side portion of said stationary bracket and movable between a locked position in which said latch member is in engagement with the toothed portion of said movable bracket to lock said steering wheel in a selected angular position and an unlocked position in which said latch member disengages from the toothed portion of said movable bracket to permit free movement of said movable bracket;

a first manual lever pivoted to said stationary bracket and movable perpendicularly with respect to the pivot axis;

an engaging element provided on said first manual lever and in engagement with said latch member for maintaining it in the locked position when said first manual lever is in a released position and for permitting movement of said latch member to the unlocked position when said first manual lever is operated to a predetermined angular position from its released position;

first resilient means for biasing said first manual lever toward its released position;

second resilient means for biasing said steering wheel into a remote position upwardly with respect to the selected angular position; and

first cam means cooperable with said first manual lever for effecting movement of said latch member to the unlocked position in response to operation of said first manual lever to the predetermined angular position and for permitting movement of said latch member to the locked position in response to release of said first manual lever;

wherein said fastening device further comprises:

a movable plate mounted on the pivot axis and movable perpendicularly with respect to the pivot axis, said movable plate being integrally formed at one end thereof with a receiver portion which is releasably in engagement with the toothed portion of said movable bracket to determine the locked position of said latch member and to receive thereon said latch member in the unlocked position;

third resilient means for biasing said movable plate toward the toothed portion of said movable bracket;

a second manual lever pivoted to said stationary bracket and movable perpendicularly with respect to the pivot axis, said second manual lever being arranged to be engaged with said first manual lever when operated toward said first manual lever over a predetermined angle;

fourth resilient means for biasing said second manual lever toward a released position spaced from the released position of said first manual lever;

stopper means for receiving said second manual lever by engagement therewith to maintain it in its released position;

second cam means cooperable with said second manual lever for disengaging the receiver portion of said movable plate from the toothed portion of said movable bracket in response to operation of said second manual lever toward the first manual lever and for engaging the receiver portion of said movable plate with the toothed portion of said movable bracket in response to release of said second manual lever; and

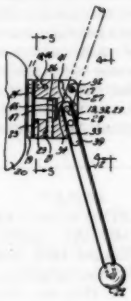
retainer means for retaining the receiver portion of said movable plate by engagement therewith in its disengaged position.

4,538,479

MACHINE TOOL LEVERAGE CONTROL HANDLE

Kenneth C. Blessing, 2757 Leach Rd., Auburn Heights, Mich. 48057

Filed Nov. 16, 1981, Ser. No. 321,629
Int. Cl.³ G05G 5/06
U.S. Cl. 74—528 **1 Claim**



1. A hand crank device adapted to be mounted on a spindle of a machine tool comprising;

means for mounting the hand crank in operative relationship to the machine including walls defining an axially located bore disposed at one end for fixedly mounting the hub axially to the machine spindle;

arm guide means including side walls and bottom walls defining an arm guide nesting channel transversely disposed on the opposite end of the hub perpendicular to the hub axis;

pivot bearing means including oppositely disposed in-line bearing diametrically and perpendicularly disposed on each side of said locking channel with the bearing intersecting the channel side walls and dividing the channel into two substantially equal symetrical arm nesting portions;

an elongated crank arm means including an elongated crank arm extending outwardly from the hub having a bearing portion adapted to nest slidably in the channel nesting portions including a pivot located adjacent one end of the arm axially aligned and journalled with the hub pivot bores to rotate in said channel about said pivot in a plane normal to said hub face to selectively engage one nesting portion of the channel or the other;

and detent means associated with said arm guide means and said crank arm means operable to hand releasably secure said crank arm selectively in either of said nesting channel positions.

4,538,480

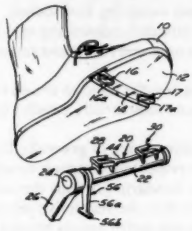
BICYCLE PEDAL AND SHOE

James J. Trindle, 35395 Beach Rd., Capistrano Beach, Calif. 92624

Filed Jul. 1, 1983, Ser. No. 510,426
Int. Cl.³ G05G 1/14
U.S. Cl. 74—594.5 **11 Claims**

1. The combination of a bicycle pedal, a shoe, and connector means formed on the pedal and the shoe for releasably connecting the shoe to the pedal in a manner to enable rotational force to be applied through the shoe to the pedal through 360° of rotation, said connector means including interengaging connectors arranged such that the shoe may be connected to and disconnected from the pedal simply by moving the shoe relative to the pedal wherein the connector means on the pedal are arranged so that the connectors define a concave curve on the surface of the pedal facing outwardly from the pedal's rotational axis, said curve being in the plane defined by the

center of curve and the pedal's rotational axis, and the connector means on the shoe are arranged to define an outwardly facing convex curve which mates with the concave connector



means on the pedal so that the normal bike pedaling action produces lateral force components tending to maintain the shoe centrally on the pedal throughout the entire 360° rotation of the pedal.

4,538,481

FIRST-ORDER BALANCER OF INTERNAL COMBUSTION ENGINE

Michio Ohta, Nara; Sakito Kamei, Sakai, and Kazumi Aoki, Nara, all of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Japan

Continuation of Ser. No. 377,560, May 12, 1982, abandoned. This application Jul. 19, 1984, Ser. No. 632,265

Int. Cl.³ F16C *3/06*

U.S. Cl. 74—603 **1 Claim**

1. A first order balancer of an internal combustion engine including a crank shaft having first and second ends comprising:

first and second forward rotating flywheels respectively fitted on said first and second ends of said crank shaft and allowed to rotate in the same direction as said crank shaft;

first and second backward rotating flywheels respectively disposed outside of each of said first and second ends of said crank shaft and coaxially therewith;

first bevel gear mechanism disposed at said first end of said crank shaft between said first forward rotating flywheel and said first backward rotating flywheel, and second bevel gear mechanism disposed at said second end of said shaft between said second forward rotating flywheel and said second backward rotating flywheel, said first and second bevel gear mechanisms adapted to rotate said backward rotating flywheels in a direction opposite from a direction of said forward rotating flywheels;

first and second forward rotational counterweights disposed respectively on said first and second forward rotating flywheels; and

first and second backward rotational counterweights respectively disposed on said first and second backward rotating flywheels said backward rotation counterweights having a different weight from said forward rotational counterweights.

4,538,482

HYDRAULIC CONTROL SYSTEM IN AUTOMATIC TRANSMISSION GEAR FOR 4 ADVANCE SPEEDS

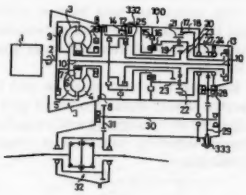
Takeo Hiramatsu, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1982, Ser. No. 433,220

Claims priority, application Japan, Oct. 31, 1981, 56-175055

Int. Cl.³ B60K *41/06*

U.S. Cl. 74—869 **3 Claims**



1. A hydraulic control system in an automatic transmission with 4 forward speeds including 1st, 2nd, 3rd and 4th speed comprising 3 clutches including at least a 4th-speed clutch for achieving the 4th speed of over-drive by connecting an input shaft with the carrier of a ravigneawx type planetary gear set and two brakes characterized in that a rotational speed detecting means which detects the synchronization of two arbitrary rotary elements of said ravigneawx type planetary gear set when the engagement of a brake for the 4th speed is disengaged and one of two clutches for the 3rd speed having a smaller torque transmitting capacity is engaged, an hydraulic control means which reduces the oil pressure to be supplied to said clutches or brakes during the gear shift and which is capable of increasing said oil pressure in response to the detected synchronzation with signals from said rotational speed detecting means, and a switch valve which switches to start the oil pressure supply to the other clutch for the 3rd speed having the greater torque transmitting capacity in response to the increase in the oil pressure in said smaller torque transmitting clutch.

4,538,483

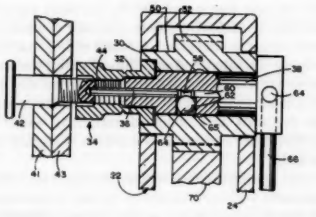
FASTENER WRENCHING MEANS

Ronald W. Batten, Torrance, Calif., assignor to V.S.I. Corporation, Pasadena, Calif.

Filed Jul. 18, 1983, Ser. No. 514,783

Int. Cl.³ B25B *17/00*

U.S. Cl. 81—56 **24 Claims**



1. A rotational wrenching tool which comprises a driven member having a distal socket and a central through bore and slideably received therein a rotationally stationary holder member having a central bore extending from one end thereof, and a central key member received within said central bore of said holder member, and positive means to axially restrain said key member in said holder member comprising

(a) a cross bore in said holder member intersecting said central bore;

(b) a ball received within said cross bore and having a diame-

ter greater than the annular thickness of said holder member surrounding said central bore;

(c) an annular groove in said driven member about said central through bore, intermediate the length of said driven member to provide a lateral outward recess for said ball;

(d) a distal groove on the inboard end of said key to provide a lateral inward recess for said ball;

(e) a spring biasing said holder member towards said one end having said central bore; and

(f) abutment stop means on said holder and cooperating means on said key to limit the axial movement of said key into said central bore when the said outer annular groove is opposite said ball;

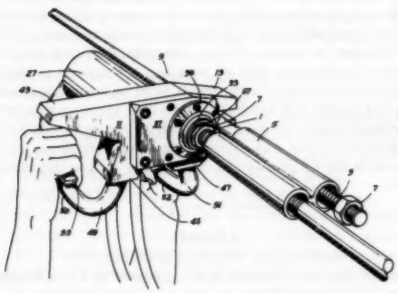
whereby said key is axially restrained in said holder when said ball is seated in said distal groove of said key and can be released therefrom by aligning said cross bore with said annular groove, whereby said ball is freed for lateral outward displacement.

4,538,484

POWER TORQUE WRENCH TOOL

Raymond D. Hardy, 7210 Princeton Rd., Rockwall, Tex. 75087, and William E. Van Steenwyk, 4341 Shady La., Barnhart, Mo. 63012

Filed May 11, 1983, Ser. No. 493,516
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.14 **1 Claim**



1. A tool for securing a nut to one of a pair of parallel rods of a Birmingham Roof Truss comprising a plate-like frame, a nut-receiving socket rotatably mounted in said frame with its axis normal to the general plane of said frame, a motor mounted on said frame and having its shaft operatively connected to said socket whereby to produce rotation of the latter when said motor is energized, a notch in one end of said frame for receiving the other rod and thus aligning the socket axially with the one rod, said notch being spaced radially from the axis of said socket substantially the same distance as the space between the rods and being of sufficient width to slidably embrace the other rod when the socket is aligned axially with the one rod;

a circular aperture being formed through said frame in axial alignment with said socket to permit projection of the one rod through said frame as the nut is tightened;

the end of said frame remote from said notch being extended to provide a torque resisting abutment for engagement with a fixed surface generally parallel to the plane containing the axes of the parallel rods;

the mouth of said socket being chamfered to facilitate engagement of said socket with a nut;

the mouth of said socket being open to one face of said frame and said motor being secured to the opposite face of said frame with its output shaft parallel to the axis of said socket;

said frame being formed with a central recess receiving said motor shaft and said socket and containing torque transmitting means operatively connecting said motor shaft and said socket;

said torque transmitting means comprising a first sprocket on said motor shaft and a second sprocket rotatably mounted in said frame and mounting said socket;

an endless chain drivingly connecting said sprockets;

a cover plate enclosing said recess and removably secured to said frame;

a pair of diverging handles secured to said frame and having handgrip portions substantially parallel to the axis of said socket;

said diverging handles being of generally U-shape and being secured at their respective terminals to said frame and said motor with the handgrip portions thereof spaced apart a greater distance than the respective terminals;

control means for said motor having manual actuating means adjacent one of said handles;

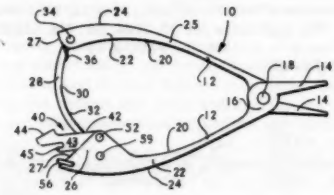
said motor being a hydraulic motor, said control means comprising a valve, and said manual actuating means comprising a lever which is substantially parallel to the adjacent handgrip portion for regulating said valve by a user while holding the tool in position by both handles against the roof of a mine.

4,538,485

LOCKABLE PLIER TOOL

Tauno Saila, 10534 Penrose St., Sun Valley, Calif. 91352

Filed Mar. 26, 1984, Ser. No. 593,087
Int. Cl.³ B25B *7/14*
U.S. Cl. 81—336 **4 Claims**



1. A plier-type tool adapted to retentatively grip an object and comprising a part of pivotally connected handles having oppositely protruding gripping jaws, one said handle having pivotally mounted thereon a ratchet, the other said handle having pivotally mounted thereon a pawl, said ratchet and pawl being separately spring biased away from the pivotal connection of said handles and that handle carrying said pawl includes means to retain the pawl out of engagement with said ratchet.

4,538,486

NON-SLIP SCREW

Jacques Lutrat, 58, Rue de Lorraine, 21200 Beaune, France

Filed Nov. 21, 1983, Ser. No. 554,140
Claims priority, application France, Nov. 22, 1982, 82 19637
Int. Cl.³ B25B *23/00*
U.S. Cl. 81—460 **1 Claim**

1. The combination of a screwdriver and screw including:

a. a screwdriver having a blade tip with outwardly extending inclined edges in diametrically opposed pie slice configuration; and

b. a threaded screw having a slotted head, including a locking surface in the form of diametrically opposed pairs of pie slices, said opposed pairs of pie slices being defined by a central transverse slot extending diametrically from one side of the screwhead to the other and at each end of said slot a pair of radially outwardly extending walls, inclined

downwardly and outwardly from said transverse slot, so as to be complementally engagable with the screwdriver

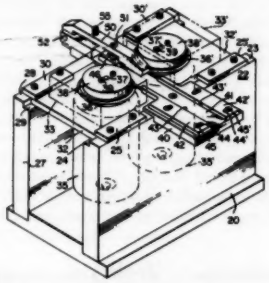
blade tip opposed pie slice configuration exterior, as defined by said outwardly extending inclined edges.

4,538,487

METHOD AND APPARATUS FOR STRIPPING SHIELDED FLAT CABLE

John G. Hatfield, Camp Hill, and Robert Volinskie, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 16, 1984, Ser. No. 600,617
Int. Cl.³ H02G *1/12*
U.S. Cl. 81—9.51 **7 Claims**



3. An apparatus for preparing the end of a shielded flat multiconductor cable for termination, the cable comprising a plurality of side by side insulated conductors in a coplanar array surrounded by a conductive shield which is surrounded by a continuous insulative outside jacket, the cable having opposed side edges and opposed flat external surfaces extending therebetween, the apparatus comprising,

guide means defining an axial feed path for said cable, said guide means confining said cable against movement transversely of its axis in the plane of the cable,

a pair of cutting blades flanking said feed path on opposite sides thereof, said blades being arranged to cut the opposed edges of said cable in the plane of the conductors, said blades being arranged to penetrate said outside jacket and said shield,

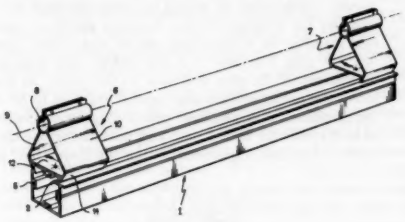
confining means for restricting said cable against movement transverse to the plane thereof in the vicinity of the cutting blades.

4,538,488

TOOL-MAKER'S LATHE

Tibor Arvai, Monte Carlo, Monaco, assignor to S. A. Fouquet, Brie, France

PCT No. PCT/FR82/00146, § 371 Date May 3, 1983, § 102(e) Date May 3, 1983, PCT Pub. No. WO83/00827, PCT Pub. Date Mar. 17, 1983
PCT Filed Sep. 9, 1982, Ser. No. 491,331
Claims priority, application Monaco, Sep. 10, 1981, 1538
Int. Cl.³ B23B *17/00*
U.S. Cl. 82—32 **7 Claims**



1. In a tool-maker's lathe comprising:

a bed made of an extrudable material and formed from an extruded die shaped section;

two heads made of an extrudable material slidably mounted on said bed to support a workpiece, said two heads being two portions of a same extruded die-shaped section;

first dovetail means located on one side of said two heads;

second dovetail means located on said bed being shaped complementary to said first dovetail means for slidably receiving said first dovetail means and for permitting sliding of said two heads on said bed; and

each of said two heads includes a cylindrical part and two wings, a stand defined by said two wings being located below the cylindrical part, each wing including an upper edge connected to the cylindrical part and a lower edge, a transverse section having lower edges and connected to the lower edges of each wing the lower edges of the transverse section defining said first dovetail means, and the cylindrical part being split and two longitudinal lips defined by said cylindrical part being located on either side of the split.

4,538,489

METHOD AND APPARATUS FOR CUTTING OFF TOP SEAL PARTS OF CONTAINERS MADE OF SYNTHETIC RESIN

Motoharu Takano, Machida, Japan, assignor to Kewpie Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,437
Claims priority, application Japan, Jul. 28, 1981, 56-118030
Int. Cl.³ B23B *3/04, 5/14;* B29D *23/03;* B28B *7/14*
U.S. Cl. 82—71 **5 Claims**

1. An apparatus for cutting off the top seal parts of containers made of flexible synthetic resin and formed by blow-molding or like process, said apparatus comprising:

a base;

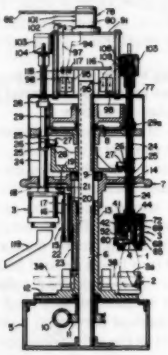
means mounted on said base for fixedly holding a container holder nonrotatably supporting a container;

at least one cutting head supported by said base, so as to be movable up and down and to be rotatable about its longitudinal axis and adapted to be fitted onto the top seal part of the container thus supported nonrotatably;

means provided on said base for rotating the cutting head about its longitudinal axis and for moving the cutting head up and down;

a cutter provided with a cutter blade and being movable perpendicularly to said longitudinal axis of the cutting head so as to be positioned against the part to be cut;

a cutter actuating mechanism for moving the cutter against the part to be cut, the cutter blade thereby revolving around and cutting the part to be cut as the cutting head is rotated and thereby cutting off the top seal part of the container, wherein said cutter actuating mechanism further comprises a head case, a cylinder positioned in said head case and into which air is supplied; a cam positioned in said cylinder and having a conical cam surface and being so supported as to be movable upon a supply of said air to said cylinder in the direction of the axis of the conical cam surface, a cam follower biased against the cam surface and being moved thereby when the cam is thus moved, compressed air means in communication with said cylinder for driving the cam to move axially, a transmitting member for holding one end of said cutter, connecting the cam follower and the cutter and transmitting movement of the cam follower to the cutter to thereby move the cutter toward and against the part to be cut of the container; and container positioning means connected to said cutter for fitting onto and positioning the top part of the container, supported within the lower part of the



cutting head and changeable to suit different dimensions and shapes of containers to be processed wherein said container positioning means is rotatably adjustably engaged with said lower part of the cutting head;

wherein said means provided on said base for rotating the cutting head about its longitudinal axis and for moving the cutting head up and down further comprises a stationary center post mounted on said base; a revolving stand revolvably supported on the center post so as to revolve thereabout; driving means connected to said revolving stand for driving the revolving stand; and a plurality of spindles mounted on said center post and each including an air passage for supplying said air to said cylinder and supporting said cutting head and transmitting rotational power thereto, the at least one cutting head further comprising a plurality of cutting heads equally spaced on a circle about said center post wherein axial rovement of said cam means causes rotational movement of said cutter about said transmitting member in such a manner that said cutter is located in a retracted position of said head case and is rotated towards said part of said container to be cut when said top seal part of said container is cut.

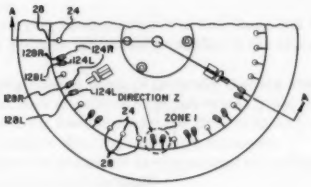
4,538,490

STAPLE FIBER CUTTER

Carol L. Becker, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,693
Int. Cl.³ B26D *1/36, 1/40*
U.S. Cl. 83—346 **5 Claims**

1. Improved apparatus for cutting a tow of continous filamentary material, into staple fiber of mixed cut length, the staple fiber comprising first filaments having lengths less than three quarters of an inch and second filaments having lengths greater than three quarters of an inch, the apparatus including (i) a plurality of blades (ii) means for supporting and spacing the blades; (iii) means for continously passing the tow over the edges of the spaced blades; and (iv) means for applying pressure on the tow to force the tow against the edges of the blades



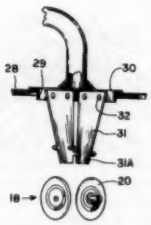
whereby the tow is cut into staple fiber and simultaneously forced through the means for supporting and spacing the blades, wherein the improvement comprises at least one pair of asymetric means for supporting a pair of blades, each of said asymetric support means comprising a slot for receiving and supporting a blade, each of said asymetric support means being asymetrical about said slot.

4,538,491

CENTERING DEVICE FOR A FOOD SLICER

Donald P. Henneuse, Scotts Valley, Calif., assignor to Magnuson Corporation, Reno, Nev.

Filed Apr. 1, 1983, Ser. No. 481,399
Int. Cl.³ B26D *1/143, 7/06*
U.S. Cl. 83—402 **1 Claim**



1. A feed apparatus for use with a slicer having a plurality of blades mounted to converge on a common center line and segment articles fed along the center line at the infeed side of said blades, said feed apparatus comprising;

means to propel the articles along a path generally coinciding with the center line of the blades;

a plurality of elongated spring members;

means holding said spring members in a position around the center line with the inside surface of the upstream end adjacent said propelling means being positioned further away from the center line than the downstream end inside surface and with the downstream end being free to contact and deflect the articles toward the center line for centering the articles relative to the blades; and

means connecting the downstream ends of said spring members to cause adjacent spring members to move outward together;

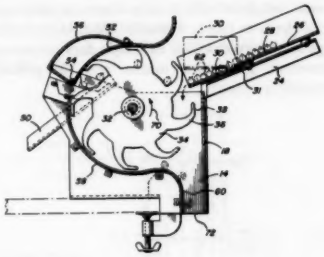
said means connecting the downstream ends being tabs extending from each downstream end in a direction overlapping and parallel to the inside surface of the adjacent spring members.

4,538,492

BEAN CUTTER

Benjamin H. Van Lue; Timothy A. Van Lue, and Vincent V. Vanlue, all of Route 1, Granby, Mo. 64844

Filed Feb. 1, 1984, Ser. No. 576,254
Int. Cl.[3] B26D 7/06
U.S. Cl. 83—411 R 8 Claims



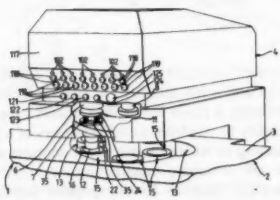
1. A cutter including an inclined chute for receiving side-by-side transversely extending elongated members thereon for gravity lateral feeding of said elongated members downwardly along said chute, a rotary shaft disposed outward of and below the lower end of said chute, a plurality of axially spaced wheels mounted on said shaft for rotation therewith, said wheels including axially registered radially outwardly projecting and circumferentially spaced arms whose outer ends are hooked in the direction of intended rotation of said shaft, stationary knife means disposed between adjacent wheels on the sides thereof remote from said chute, the axially registered arms of said wheels being operable to engage, lift and convey elongated members from the lower end of said chute past said knife means for cutting said elongated members into a plurality of short elongated member sections, said chute including a lower end portion thereof hinged supported therefrom for angular displacement relative to the upper portion of said chute about a horziontal axis extending transversely of said chute, said lower end portion being swingable between a lower position substantially paralleling the adjacent upper portion of the chute and a raised position reducing the effect of gravity feed of said elongated members downwardly along said lower end portion, said registered arms being engageable with said lower end portion to swing the latter from said lower position toward said upper position as each set of registered arms of said wheels swing upwardly past the lower end of said chute.

4,538,493

MACHINE TOOL FOR WORKING SHEET METAL

Eugenio Perazzolo, Rovigo, and Mauro Tomasi, Bologna, both of Italy, assignors to Rainer S.r.l., Bologna, Italy

Filed Sep. 15, 1983, Ser. No. 532,531
Claims priority, application Italy, Sep. 27, 1982, 3545 A/82
Int. Cl.[3] B26D 5/08; B26F 1/14
U.S. Cl. 83—530 12 Claims



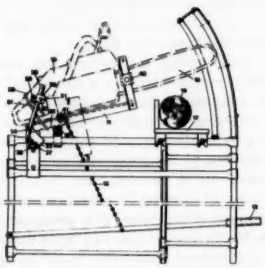
1. A machine tool for working sheet metal comprising:
an upper rotatable turret (7) supporting, in a ring, a plurality of translatable pins (11) each of which carries a tool (12) of the punching or nibbling type;
a lower rotatable turret (14) parallel to and connected with the upper turret (7) and supporting, in a ring, a plurality of holders (15), the number of which is equal to the number of pins (11) and each of which supports a die (16) in such a way that each tool (12) has one die (16) associated therewith,
a striker (6) operable to translate between an upper dead point and a lower dead point under the action of a transmission system which, in use, controls the pressure of said striker (6) on a head (24) of one of said pins (11) in such a way that the pin translates downwardly and the tool (12) associated therewith causes a cutting or nibbling of a portion of a metal sheet positioned over the die (16) associated therewith by entering into a hole (63) in said die (16), and electronic means (5) by which an operator can, in use, adjust the stroke of the said striker (6) and thereby a lower dead point and an upper dead point for each tool (12), said electronic means (15) including members (115) for identifying which tool (12) is involved in the adjustment, a first member (105) for adjusting the upper dead point of said striker (6) for each tool (12), a second member (112) for adjusting the lower dead point of said striker (6) for each tool (12) and a comparison member (75) for comparing the stroke as adjusted by means of the first (105) and second (112) adjustment members and the stroke which said striker (6) then performs on each tool (12) in such a way as to be able to control, by means of a first blocking member and a second blocking member (96) the stopping of the translation of the said striker (6).

4,538,494

MEANS FOR ACTUATING THE THROTTLE OF A PIVOTABLY MOUNTED CHAIN SAW

Sven A. O. Wirfelt, N.-Liebersbach, Fed. Rep. of Germany, assignor to Sandvik AB, Sandviken, Sweden

Filed Apr. 24, 1984, Ser. No. 603,317
Claims priority, application Sweden, Nov. 29, 1982, 8206794
Int. Cl.[3] B27B 17/02
U.S. Cl. 83—796 7 Claims



1. A throttle actuating mechanism for use with a chain saw having a trigger and mounted for pivotal movement about an axis from a rest position toward a workpiece, said mechanism comprising:
a pivotally mounted lever having trigger engaging means oriented for engagement by the chain saw trigger in response to pivotal movement of the chain saw toward a workpiece, so that said lever is pivoted in a first direction along with the chain saw;
a spring yieldably opposing pivotal movement of said lever in said first direction to cause said trigger engaging means to act upon and actuate the chain saw trigger as the chain saw moves from said rest position and toward the workpiece, and

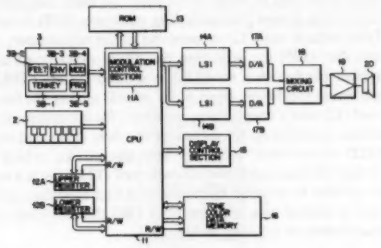
stop means engageable with said lever to terminate movement of said lever in a direction opposite said first direction and prior to arrival of the chain saw in its rest position when pivoting away from the workpiece, so that the chain saw trigger is deactivated when the chain saw reaches its rest position.

4,538,495

TONE COLOR SETTING APPARATUS

Kunio Sato, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 461,183, Jan. 26, 1983, abandoned. This application Oct. 22, 1984, Ser. No. 663,815
Claims priority, application Japan, Feb. 4, 1982, 57-15654
Int. Cl.³ G10H *1/06, 7/00*
U.S. Cl. 84—1.19 **12 Claims**



1. A tone color setting apparatus comprising:

tone color data memory means including at least first memory means for storing a first tone color group including a plurality of tone color data, and second memory means for storing a second tone color group including a plurality of tone color data different from that of said first tone color group; and

tone color setting means coupled to said tone color data memory means for designating a desired one of tone color data from each corresponding tone color group of said at least first and second memory means, and for combining the designated tone color data;

said tone color setting means including tone color group designating means including a number of actuable members for designating the tone color groups and key input means including a plurality of actuable keys each corresponding to a different tone color data selection for the tone color data group designated by said tone color group designating means, the tone color data of each tone color group being designated by actuations of one of the actuable members of said tone color group designating means and one of the keys of said key input means; and

wherein a combined tone color is set by said tone color setting means for forming musical tones to be generated from tone generating means.

4,538,496

ELECTRONIC MUSICAL INSTRUMENT

Koutarou Hanzawa, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,461
Claims priority, application Japan, Jul. 31, 1982, 57-134580; Jul. 31, 1982, 57-134581; Jul. 31, 1982, 57-134582
Int. Cl.³ G10H *1/057*
U.S. Cl. 84—1.26 **10 Claims**

1. An electronic musical instrument, comprising:

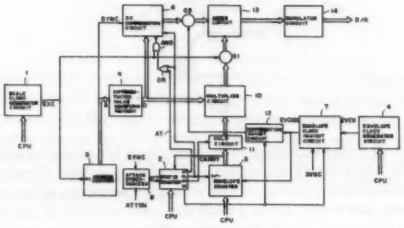
a musical note clock generation means for generating a musical note clock which corresponds to a musical note designated by an operated key;

storage means for storing differential data of musical sound waveforms;

envelope clock generation means for generating an envelope clock which is in asynchronous relation with said musical note clock;

envelope generation means for generating envelope data in synchronism with said envelope clock;

multiplication means for multiplying the differential data when read out from said storage means according to the timing of the note clock outputted from said musical note clock generation means, by envelope data outputted from said envelope generation means, and for producing a corresponding output;



direct current compensation means for receiving the outputs of said multiplication means and said storage means, and for canceling a direct current component of the output of said multiplication means, said direct current component being one which would otherwise be produced due to the asynchronous relation between said musical note clock and said envelope clock; and

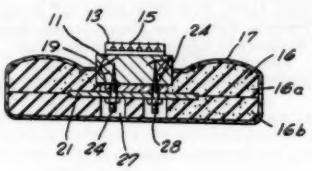
means for accumulating the output of said direct current compensation means and for generating a musical sound waveform on the basis of the output of said multiplication means, the direct current component of the output of said multiplication means being canceled by said direct current compensation means.

4,538,497

SOFT BODY GUITAR

Walter E. Smith, P.O. Box 707, Weiser, Id. 83672

Filed Dec. 2, 1982, Ser. No. 446,184
Int. Cl.³ G10D *1/08*
U.S. Cl. 84—291 **4 Claims**



1. In a musical stringed instrument, the combination of: a stem, a bridge and a nut mounted at spaced locations on said stem and defining a plane for strings, a soft support member having flexibility to conform to the contours of a human body in either standing or sitting position, the support member having internal soft structure maintaining its overall shape and thickness, a plate member having greater density than said stem and secured thereto at a location enclosed within said soft support member, and a stiffener element secured relative to said plate member and having laterally extending portions, said

soft support member being divided to receive said laterally extending portions.

4,538,498

IMPROVEMENTS IN AND RELATING TO AN ACOUSTIC GUITAR BRIDGE

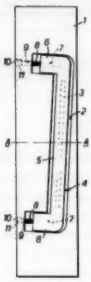
Timothy J. Marten, 73 Crayford Rd., London N7, England

Filed Oct. 24, 1983, Ser. No. 544,832

Claims priority, application United Kingdom, Oct. 28, 1982, 8230782; Apr. 21, 1983, 8310833

Int. Cl.³ G10D *3/04*

U.S. Cl. 84—298 **10 Claims**



1. An acoustic guitar bridge comprising a body shell for attachment to the body of a guitar, an adjustable saddle member for supporting the strings of the guitar and an adjustable support member for engaging and supporting the saddle member along its length, the support member being housed within the shell and the saddle member being arranged in a slot in the shell, those members being mounted for movement, relative to the body shell, in respective directions lying transverse to each other and engaging each other through surfaces at least one of which is inclined to the direction of movement of the support member whereby movement of the support member varies the height of the saddle member relative to the body shell.

4,538,499

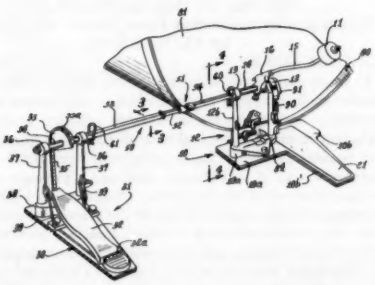
DRUM BEATING APPARATUS

Duane P. Livingston, 1025 17th St., Apt. A, Santa Monica, Calif. 90402

Filed Jan. 14, 1983, Ser. No. 457,967

Int. Cl.³ G10D *13/00*

U.S. Cl. 84—422 R **21 Claims**



1. In a drum beating assembly, the combination comprising

(a) a first base in the form of a first plate, a first drum beater and first support therefor mounted on the first base,

(b) a second base in the form of a second plate, and a foot operated drive on the second base, one base adjustably movable to a selected position relative to the other base,

(c) coupling means, including at least one universal joint, intercoupling the foot operated drive and the first drum beater, and

(d) the first base having a laterally extending portion to optionally receive and carry a second support for a second drum beater to be driven by a second foot operated drive,

(e) and including said second drum beater, second support and a second drive which are carried by said laterally extending portion of the first base, in separate and laterally offset relation to said first beater first support,

(f) each of said first and second supports including two upright pedestals and a yoke supporting the pedestals, the first support yoke attached to the first base, and the second support yoke spaced from the first yoke and adjustably supported on said laterally extending portion of the first base.

4,538,500

APPARATUS FOR PRINTING OUT GRAPHICAL PATTERNS

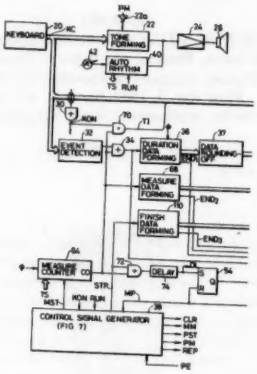
Koichi Kozuki, Hamamatsu, and Tatsuhiro Koike, Hamakita, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

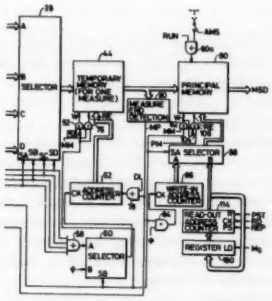
Filed Aug. 22, 1983, Ser. No. 525,607

Claims priority, application Japan, Aug. 25, 1982, 57-147230

Int. Cl.³ G10G *3/04*

U.S. Cl. 84—462 **6 Claims**





1. An apparatus for printing out graphical patterns, comprising:

means for successively receiving a data signal representing consecutive discrete blocks of graphical patterns;

memory means connected to the receiving means to store a data portion contained in said data signal and constituting at least one of said discrete blocks of graphical patterns;

read-out means connected to said memory means to timewisely successively read out said data portion stored in said memory means;

printing means connected to said read-out means to timewisely successively print out a graphical pattern on a recording sheet in accordance with the data portion being read out from said memory means;

first controlling means connected to said read-out means and to said printing means to suspend the print-out operation at a point midway of one of said discrete blocks of graphical pattern;

resumption commanding means to command to resume the suspended printing-out operation; and

second controlling means connected to said resumption commanding means, to said read-out means and to said printing means to cause to resume the print-out operation at least from the beginning of said discrete block of graphical pattern containing said point at which the print-out operation has been suspended, in accordance with a resumption command delivered from said resumption commanding means.

4,538,501

ELECTRONIC MUSICAL CHORD CALCULATOR

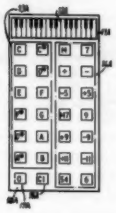
Raymond B. Smith, Preston, and Brian F. Tranter, Lancashire, both of England, assignors to Speedyplain Limited, England

Filed Apr. 7, 1982, Ser. No. 366,273

Claims priority, application United Kingdom, Apr. 7, 1981, 8110775

Int. Cl.³ G09B *15/02*

U.S. Cl. 84—478 **18 Claims**



1. An electronic musical chord calculator comprising:

(a) a plurality of finger-actuatable devices, some of which correspond to musical notes and other of which correspond to chords and all of which each produce a demand signal when activated,

(b) indicator means having a plurality of devices or parts, each corresponding to different notes so as to display any chord specifiable by said finger-actuatable devices,

(c) means responsive to said demand signal from a selected said finger-actuatable device corresponding to a note for immediately producing first signals for the indicator means and representative of a certain predetermined chord for that note,

(d) logic means, and

(e) means then responsive to said demand signal from a selected said finger-actuatable device corresponding to a chord for operating said logic means to replace said first signals with relatively modified second signals as inputs to said indicator means representative of the selected chords.

4,538,502

RECONVERSION DEVICE FOR A GUN FROM SEMI-AUTOMATIC TO PUMP OPERATION

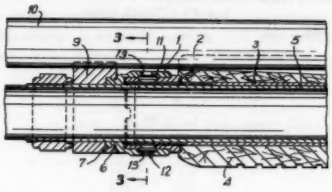
Paolo Benelli, Pesaro, Italy, assignor to Benelli Armi S.p.A., Italy

Filed Apr. 8, 1983, Ser. No. 483,218

Claims priority, application Italy, Apr. 28, 1982, 44010 A/82

Int. Cl.³ F41C *7/06*

U.S. Cl. 89—128 **3 Claims**



1. Reconversion device from a semi-automatic operation of the fixed barrel type using the kinetic recoil energy of the arm for the ejection of the cartridge and the recocking of the arm and comprising a breech bolt head separated from the breech bolt with a spring freely interposed between them, to a pump system, characterized in that it comprises an annular control handle rotatably supported on a ring secured to an end of a tubular cocking rod axially slidable on a tubular magazine, said handle and said ring being provided with means for their mutual snap action engagement in four positions at 90° to one another, said handle having, projecting from an end front face thereof, two diametrically opposite sectors each ending in a tooth and the front face of a support of the magazine, secured to the barrel, facing the end front face of the handle having an annular recess with two diametrically opposite passages having a height larger than that of the remaining annular recess, said recess communicating with an annular undercut groove in the support, the two passages of the annular recess having a larger height being adapted to receive the teeth of the two sectors projecting from the end front face of the handle, the four snap engagement positions of the handle and the ring secured to the cocking rod corresponding, alternatively, to the engagement of the teeth of the two sectors in the undercut groove in the support of the magazine and the disengagement of the teeth of the two sectors from said undercut groove.

4,538,503

VACUUM BOOSTER DIAPHRAGM MOUNTING

Nobuaki Hachiro, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed May 13, 1983, Ser. No. 494,330

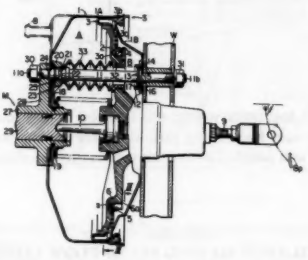
Claims priority, application Japan, Aug. 5, 1982, 57-136474

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—376 R **8 Claims**

1. In an improved vacuum booster device comprising; a booster shell; a booster piston housed in said booster shell in a forwardly and backwardly movable manner; a diaphragm including an inner peripheral bead tilted onto a rear surface of said booster piston, an outer peripheral bead fitted onto the peripheral wall of said booster shell and a pressure receiving portion superposed on the surface of said booster piston, said diaphragm being adapted to divide the interior of said booster shell into a front-side first working chamber communicating with a vacuum source and a rear-side second working chamber in cooperation with said booster piston; an input rod supported by said booster piston for advancing and retracting movements; and a control valve operably connected with said input rod to selectively communicate said second working chamber with said first working chamber or the atmosphere, the improvement wherein said inner peripheral bead of said diaphragm is tightly fitted in an annular fitting groove formed in

the rear surface of said booster piston with the aid of a clamping force given by a clamping band mounted to said inner peripheral bead; said inner peripheral bead having a bottom surface fitted to a bottom portion of said fitting groove, a side surface fitted to a rear side wall of the groove and an upper surface located opposite to said bottom surface receiving said clamping band, a part of said inner peripheral bead being formed as a recessed portion having a thin-walled side wall portion in close contact but separably with the rear surface of said booster piston and a thin-walled bottom wall portion in close contact but separably with the bottom portion of said fitting groove, said thin-walled side wall portion of the recessed portion being recessed from a side on which said recessed portion faces said clamping band so as to have a thickness smaller than that of the pressure receiving portion of said diaphragm, said recessed portion engaging with a notched recess formed in the rear side wall of said fitting groove; wherein said recessed portion constitutes a thin-walled elastic valve portion which is normally in close-contact with the rear surface of the booster piston and the bottom portion of said fitting groove and which is deformable as required to provide communication between said first and second working chambers through said valve portion free from engagement with said clamping band.

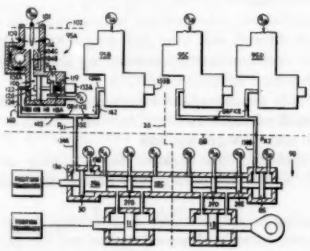


4,538,504

FAIL-SAFE SERVOVALVE SYSTEM

Howard B. Kast, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Nov. 18, 1983, Ser. No. 553,336
Int. Cl.³ F15B *13/042*
U.S. Cl. 91—461 **3 Claims**



1. In a hydromechanical actuator comprising a modulator piston which controls the application of fluid pressure to a ram piston, the improvements comprising:

(a) means for applying a substantially constant first pressure to the modulator piston for biasing the modulator piston in a first direction;

(b) manifold means for applying a manifold pressure to the modulator piston for biasing the modulator piston in a second direction opposite to the first direction of (a);

(c) a plurality of servovalves,

(i) each having an outlet connected to the manifold for supplying pressure to the manifold

(ii) each having means for blocking flow in both directions in the outlet of the servovalve when the pressure in the outlet attains a predetermined relationship with a reference pressure, the occurrence of said blocking being termed a failure response,

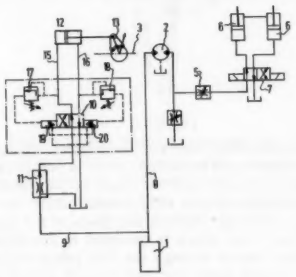
wherein, upon the occurrence of the failure response of (c)(ii), the failed valve becomes inhibited from controlling the modulator piston and control of the modulator piston is maintained by the remaining nonfailed valves within the plurality of valves of (c).

4,538,505

EXTRACTING SCREW APPARATUS

Théodore Morillon, Andreze, France, assignor to Etablissements Morillon, Beaupreau, France

Filed Mar. 1, 1983, Ser. No. 471,037
Claims priority, application France, Mar. 2, 1982, 82 03655
Int. Cl.³ F15B *11/02*
U.S. Cl. 91—518 **3 Claims**



1. A hydraulically controlled screw extracting apparatus for a flat bottom storage unit for bulk materials, said screw extracting apparatus comprising an extracting screw rotatable about its axis and connected to a driving shaft, a hydraulic system including an hydraulic motor, means for supplying a fluid under pressure to said hydraulic motor for rotationally driving said extracting screw about its axis and means for producing sweeping movement of said extracting screw about a vertical axis, said hydraulic system also comprising hydraulic control means operating at relatively low pressure for producing high starting torque for rotation of said extracting screw about its axis to overcome the load moment caused by the accumulation of bulk material around said extracting screw after a period of non use, said hydraulic control means comprising a double-acting hydraulic actuator, intermittent drive means fixed for rotation with said driving shaft for converting reciprocating movement transmitted by said hydraulic actuator into intermittent angular movement imparted to said extracting screw, and hydraulic control circuit means interrupting the operation of said hydraulic actuator once normal operating torque has been reached, whereupon said extracting screw is driven by said hydraulic motor alone, said hydraulic control circuit means comprising a first line for supplying hydraulic fluid from a pump to said hydraulic actuator, a distributor valve, a pair of calibrated check valves for controlling said distributor valve, said distributor valve being disposed to connect said first line through second or third lines to the respective sides of the piston of said hydraulic actuator, a pressure relief valve being provided along each of said second and third lines and being responsive to the increase in pressure in said second or third lines to actuate said distributor valve to change its position

when the pressure in said second or third lines reaches a predetermined value, and a fourth line connected to said distributor valve to drain said second or third lines.

4,538,506

CYLINDER WITH TWO-STEP MOVEMENT

Karl E. Mattsson, Nässum, Sweden, assignor to AB Volvo, Gothenburg, Sweden

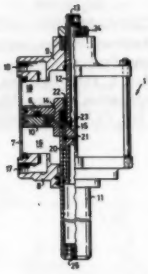
PCT No. PCT/SE83/00334, § 371 Date May 15, 1984, § 102(e) Date May 15, 1984, PCT Pub. No. WO84/01192, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 22, 1983, Ser. No. 611,970

Claims priority, application Sweden, Sep. 23, 1982, 8205447

Int. Cl.³ F15B *15/24;* F01B *7/00*

U.S. Cl. 92—13.3 **13 Claims**



1. In a cylinder with two-step movement, comprising a housing with a first and a second end piece, a first and a second piston sliding in contact with the inside of the housing, said second piston supporting a tube-shaped piston rod which moves sealingly through the first end piece of the housing, a pressure medium tube which is mounted in the second end piece and which passes through the first piston and extends into the tube-shaped piston rod and through which pressure medium can be led into or out of a first chamber between the first and the second pistons, and between the first end piece and the second piston a second chamber, and between the second end piece and the first piston a third chamber, the second and the third chambers each having a pressure medium connection; the improvement in which the end of the pressure medium tube extending into the piston rod has a contact portion adapted to contact the inside of the piston rod thus making the pressure medium tube serve as a guide both for the piston rod and for the second piston connected to the piston rod.

4,538,507

AIR CIRCULATION SYSTEM AND AIR FLOW ELEMENTS THEREFOR

Hervin J. Bergeron, Jr., Opelousas, La., assignor to Stephen J. Ledet, Jr., Opelousas and James D. Elder, Sulphur, both of, La., part interest to each

Division of Ser. No. 230,375, Feb. 2, 1981, Pat. No. 4,440,343, which is a continuation-in-part of Ser. No. 54,659, Jul. 3, 1979, Pat. No. 4,505,325, and Ser. No. 135,073, Mar. 28, 1980,. This application Sep. 8, 1983, Ser. No. 530,211

Int. Cl.³ F24F *13/00;* F24H *7/00*

U.S. Cl. 98—31.5 **5 Claims**

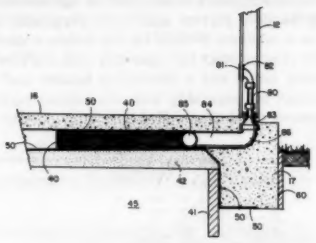
1. An air circulation and structural support system for use with a generally enclosed structure having at least enclosing walls, a roof and a slab/floor, which structural system comprises:

(a) an expanded clay lightweight aggregate mass having void air spaces therein enabling air to pass through said mass;

(b) film sheet enveloping said mass for preventing water flow into said mass from the exterior;

(c) means adapted to receive a flow of air from the interior of the enclosed structure and to distribute the air into said aggregate mass at generally interior locations; and

(d) means adapted to receive flowing air at locations around the periphery of said mass and to distribute the air at



peripheral locations within the interior of the enclosed structure; said mass being positioned on the site for said structure and adapted to furnish support to the slab/floor thereof.

4,538,508

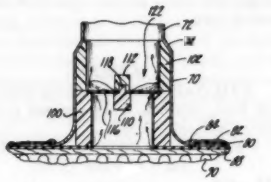
ROOF VENTILATOR HAVING FLUID FLOW CONTROL AND METHOD OF MAKING SAME

James W. Ballard, Livonia, Mich., assignor to Jimco Products, Livonia, Mich.

Continuation-in-part of Ser. No. 402,020, Jul. 23, 1982, which is a continuation-in-part of Ser. No. 172,414, Jul. 25, 1980, Pat. No. 4,370,876, which is a division of Ser. No. 968,192, Dec. 11, 1978, Pat. No. 4,214,513, and a continuation-in-part of Ser. No. 193,711, Oct., 1980, Pat. No. Re. 31,549. This application Feb. 1, 1984, Ser. No. 575,827

Int. Cl.³ F24F *7/00*

U.S. Cl. 98—42.17 **24 Claims**



1. A roof ventilation device, comprising:

an elongate hollow tube member having openings in opposite ends thereof, said tube including a longitudinal passageway communicatively connecting said openings and through which air may flow;

a substantially planar valve member extending transversely across said passageway for controlling the flow of fluid through said passageway; and

means within said tube member for mounting said valve member within said passageway intermediate said openings,

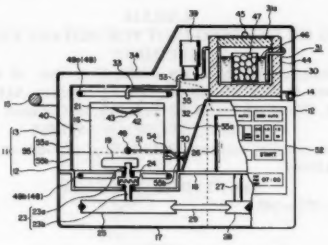
said mounting means including a cylindrical sleeve of synthetic foam material disposed within and secured to said tube member, said sleeve having an outside cylindrical wall conformally engaging the inside wall of said tube member to prevent fluid flow therebetween, said sleeve having an inside cylindrical wall defining a portion of the flow path of fluid through said tube member,

said mounting means further including an elongate strut formed integral with said inside cylindrical wall and extending transversely across said flow path, and means for securing said valve member on said strut.

4,538,509
AUTOMATIC BREAD BAKING MACHINE

Shin Ojima, Yao; Hideaki Kamiuchi, Matsubara, and Keiji Mine, Yao, all of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Jun. 28, 1984, Ser. No. 625,872
Claims priority, application Japan, Aug. 22, 1983, 58-130100; Dec. 2, 1983, 58-185758
Int. Cl.³ A47J *27/00*
U.S. Cl. 99—348 **26 Claims**



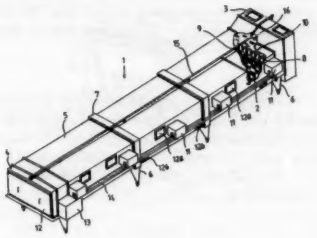
1. An automatic bread baking machine comprising:
housing;
a container removably mounted in the housing, for containing the ingredients of bread;
water supply means mounted in the housing;
kneading means for kneading the ingredients of bread with water into dough in the container, said kneading means comprising a rotary shaft which extends through the bottom of said container, at least one rotary vane mounted on an upper end of said rotary shaft inside of said container to extend perpendicularly to said rotary shaft, a fixed rod mounted in said container adjacent to and spaced from said rotary vane, said fixed rod being oriented transverse to the axis of rotation of said rotary shaft, and a motor mounted in said housing outside of said container for driving said rotary shaft to effect movement of said vane past said fixed rod thereby to cause the dough being kneaded to turn about said fixed rod as said vane rotates in said container;
a heater in the housing for baking the dough in the container; and
a controller for performing, in a sequential order, a kneading step in which water is supplied from the water supply means to the container and the kneading means is driven to produce the dough, a fermentation step for fermenting the dough, and a baking step for baking the fermented dough by use of the heater.

4,538,510
CONVEYORS

John Latimer, and Neil Fortune, both of Auckland, New Zealand, assignors to Mauri Brothers & Thomson (N.Z.) Limited, Auckland, New Zealand

Filed Nov. 28, 1983, Ser. No. 555,645
Claims priority, application New Zealand, Nov. 26, 1982, 202632
Int. Cl.³ A01J *25/00*
U.S. Cl. 99—459 **11 Claims**

1. A conveyor comprising:
an endless plastics conveying belt made of a plurality of members pivotally interconnected in end to end relationship to form a belt having upper and lower flights;
a bed of runners extending below said upper flight of said belt to support the upper flight of said belt along its length;
sprocket means at each end of said belt between said flights around which said belt travels to drive said belt;
drive means operatively engaged to one of said sprocket means to rotate said one sprocket means to drive said belt;
side members extending along the longitudinal edges of said belt; and
an inclined support step integral with each side member extending under the respective longitudinal edge of said belt to support said longitudinal edge with part of said step

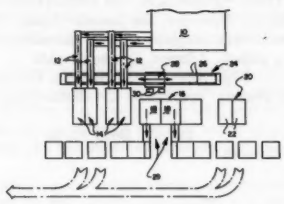


extending above said belt, so that said part of said step and a part of said side member above said step provide a confining means for a product being conveyed and allow said belt to move up and down the inclined surface on the step to accommodate dimensional variations in said belt.

4,538,511
SIGNATURE HANDLING APPARATUS

James C. Wise, Jackson Springs, N.C., assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Aug. 24, 1983, Ser. No. 525,840
Int. Cl.³ B65B *13/04*
U.S. Cl. 100—7 **16 Claims**



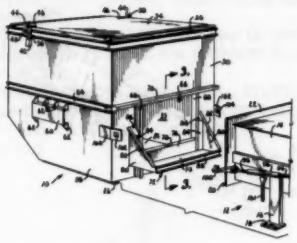
1. Apparatus comprising a stacker which receives a stream of signatures and forms the signatures into a stack,
a transfer vehicle movable along a guide track to a stack pickup position adjacent said stacker, said transfer vehicle having a clamping mechanism which includes means for clamping a stack of signatures on a stacker and for removing the signatures from the stacker while said transfer vehicle is in said stack pickup position, said transfer vehicle being movable along said guide track from said stacker to a tying station to move a stack of signatures to the tying station,
means for tying a stack of signatures at said tying station including means defining a strap guide for guiding a tying strap around the stack while the transfer vehicle is at the tying station, said means defining a guide comprising a first guide portion connected with said transfer vehicle and a second strap guide portion disposed at said tying station, said first and second strap guide portions cooperating to define said strap guide when said transfer vehicle is at said tying station.

4,538,512

REFUSE RECEPTACLE WITH LIQUID RETAINER

James A. Blough, 308 East Smith St., Hesston, Kans. 67062

Filed Apr. 20, 1984, Ser. No. 602,556
Int. Cl.³ B30B 9/02
U.S. Cl. 100—131 10 Claims



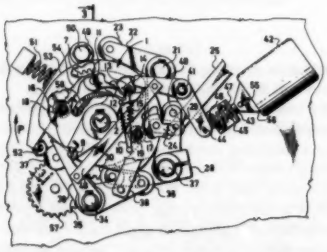
1. In a trash container having a wall presenting an opening for receiving refuse from a trash compactor having an open end adapted to register with the opening, the improvement comprising a spillage collector generally underlying said opening on the exterior of the trash container for receiving material spillage, said collector extending generally outwardly from said wall of the trash container and presenting a trough below the opening for receiving and retaining liquid that spills during transfer of refuse from the compactor into the container through said opening and solids that spill from said opening when the container is separated from the compactor, and means providing a lip extending from said trough and along said wall of the trash container on opposite sides of said opening and above said opening to inhibit drainage of liquid from the trough along said wall when the trash container is inverted.

4,538,513

MECHANISM FOR THE AUTOMATIC CONTROL OF PRINTING PRESSURES ON PRINTING MACHINES

Vaclav Sedlák, Jedovnice, and Jaroslav Jiruse, Blansko, both of Czechoslovakia, assignors to ZVS Adamovske strojirny, koncernovy podnik, Adamov, Czechoslovakia

Filed Nov. 8, 1984, Ser. No. 669,812
Claims priority, application Czechoslovakia, Nov. 9, 1983, 8255-83
Int. Cl.³ B41J 45/00
U.S. Cl. 101—76 5 Claims



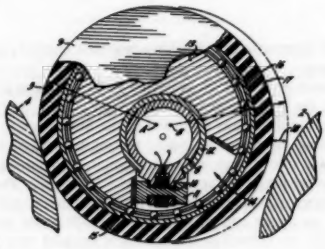
1. A mechanism for the automatic control of printing machines, particularly accessory devices for additional printing, and wherein the single functions are carried out in predetermined intervals according to the working cycle of the printing machine, the mechanism having a double-peripheral cam about which there are arranged a plurality of two-arm levers mounted on fixed pivots, connected to a first two-arm lever which is swingably arranged on a first pivot there is connected by means of a first pull rod the mechanism of an inker unit, a second two-arm lever being mounted on a second pivot, the second two-arm lever being rotatably mounted on a fixed structure of the printing machine, the second pivot being connected by means of a second pull rod with the mechanism for producing printing pressure, and a third two-arm lever which is swingably arranged on a third pivot, the third two-arm lever being connected by means of a third pull rod with the mechanism for the progressive changing of the numbers in the numbering devices of the printing mechanism.

4,538,514

INKING OR DAMPING UNIT FOR ROTARY PRINTING MACHINES

Claus Simeth, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 627,848
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3324447
Int. Cl.³ B41F 7/26, 31/38
U.S. Cl. 101—148 7 Claims



1. An inking or damping unit for use with rotary printing machines including a metering roller and a transfer roller in contra-rotating contact above the metering roller and the transfer roller so that a film of liquid which is substantially uniform over the entire roller width is produced at the roller nip outlet, said rollers being followed by at least one other machine roller, and a plurality of zone rollers eccentrically mounted side by side on a carrier tube and selectively movable between the transfer roller and said following machine roller for the purpose of zonally metering the film of liquid, characterized in that an electric coil with a magnet core is provided on the carrier tube within the width of each zone roller, bearing means are mounted on the carrier tube, an eccentrically apertured middle part of the zone roller is mounted pivotably on the bearing means, and the middle part has a free space in the region of the magnet core to permit eccentric pivoting of the zone roller.

4,538,515

PRINTING MACHINE WITH PROGRAMMED CONTROL OF PRINT CYLINDER MOTOR AND WEB TRACTOR FEED MOTOR

John Tymkewicz, Fairview Park; Robert L. Phillips, Cleveland, and Richard M. Park, Parma, all of Ohio, assignors to Marlin Manufacturing Corporation, Cleveland, Ohio

Continuation of Ser. No. 484,683, Apr. 13, 1983, abandoned. This application Oct. 2, 1984, Ser. No. 657,042
Int. Cl.³ B41F 5/00
U.S. Cl. 101—216 6 Claims

1. Printing apparatus for applying an ink marking at selected intervals on a moving web of paper comprising:

tractor drive means including means for engaging said web;

a first drive shaft rotatably mounted to a printer housing and

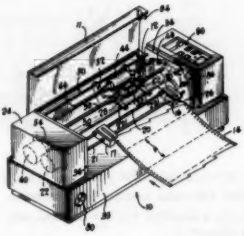
coupled to said tractor drive for moving the paper along a path of travel to a print station;

a first motor for rotating said first drive shaft to move said web toward said print station;

a print cylinder having a rubber die mounted to said cylinder's exterior;

a second drive shaft to which said cylinder is mounted, said second drive shaft rotatably mounted to said printer housing;

a second motor coupled to said second drive shaft for selectively rotating said print cylinder to cause said die to strike said web;



a backing roller over which said web moves in the vicinity of said print cylinder which forms a nip with said die;

means for inking said die each time said cylinder rotates about its axis of rotation so that said die applies said marking to the web each time it rotates into contact with said web; and

circuitry coupled to said first and second motors to energize said motors at coordinated times to control the spacing between successive marks on said web.

4,538,516

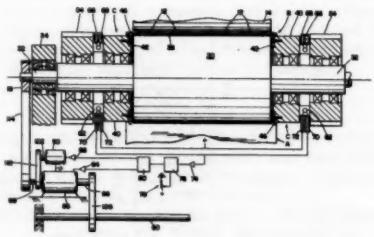
TORQUE-ASSIST SYSTEM FOR PRINTING BELTS

Charles Aaron, West Caldwell, N.J., assignor to Somerset Technologies, Inc., New Brunswick, N.J.

Continuation of Ser. No. 30,694, Apr. 16, 1979, abandoned. This application Aug. 13, 1981, Ser. No. 292,390

Int. Cl.³ E16H *55/00*; B41F *5/04*

U.S. Cl. 101—219 **17 Claims**



16. A belt drive system, comprising:

a rotatable cylinder for tractively engaging, supporting and guiding a movable belt,

belt drive means at the opposite ends of said cylinder for positively driving a belt past said cylinder, said belt drive means being rotatable independently of said cylinder,

selectively operable torque assist means for selectively driving said cylinder to prevent relative movement between said belt drive means and the belt,

means, independent from said torque assist means for driving said belt drive means whereby a drag condition may be imparted to said belt which tends to cause said belt to skip relative to said cylinder and belt drive means,

sensing means disposed in contact with said belt drive means for sensing changes in loading that would tend to cause said belt drive means to skip, and

means responsive to said sensing means for operating said torque assist means to vary the torque applied to said plate cylinder by said torque assist means in response to said condition sensed to alleviate such tendency to skip.

4,538,517

PAPER WEB GUIDING MECHANISM

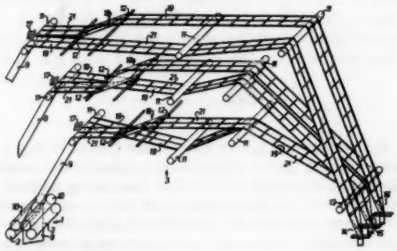
Horst B. Michalik, Höchberg, and Erich A. Klingenmeier, Würzburg, both of Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 536,795

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237504

Int. Cl.³ B41F *13/02*

U.S. Cl. 101—227 **2 Claims**



1. A paper web guiding mechanism for selectively guiding a paper web being printed in a web fed rotary printing machine which includes a printing couple having a width corresponding to the maximum width of the paper web being printed to at least one former, said paper web guiding mechanism comprising:

at least three formers positioned adjacent each other in the same horizontal plane and intermediate the printing couple of the printing machine and a folder, said plurality of formers having a combined width in excess of one and a quarter times the maximum width of the paper web being printed;

at least one longitudinal slitting means for slitting the paper web printed by the printing machine into a plurality of partial web segments, said slitting means being positioned intermediate said printing couple and said plurality of formers;

a plurality of paper guide rollers and a prefeed former roller disposed intermediate the printing couple and said formers, said paper guide rollers and said prefeed former roller each having a width generally the same as said combined width of said at least three formers and in excess of one and a quarter times the maximum width of the paper web printed by the printing machine, said prefeed former roller being positioned intermediate said slitting means and said formers; and

turning bars for each of the paper webs printed by the printing machine, each of said turning bars being positioned intermediate said printing couple and said prefeed former roller, each of said turning bars further being supported for displacement along the entire width of said at least three formers and said plurality of paper guide rollers and prefeed roller to allow selective shifting of at least one of said partial web segments laterally with respect to said printing couple and parallel to a remainder portion of said paper web whereby the printed paper web can be mixed in various arrays.

4,538,518

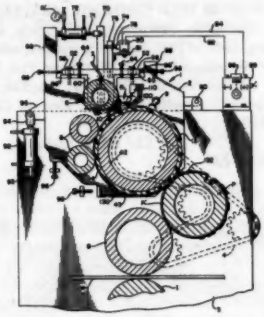
INK METERING APPARATUS

Harold P. Dahlgren, 726 Regal Row, Dallas, Tex. 75247

Continuation of Ser. No. 341,641, Jan. 22, 1982, abandoned, which is a continuation of Ser. No. 142,596, Apr. 22, 1980, abandoned, which is a continuation of Ser. No. 948,355, Oct. 3, 1978, abandoned, which is a continuation of Ser. No. 779,647, Mar. 21, 1977, abandoned. This application Jul. 27, 1984, Ser. No. 634,670

Int. Cl.[3] **B41F** *31/04;* **B41L** *27/06*

U.S. Cl. 101—350 **5 Claims**



1. A metering member to form a thin film of lithographic printing ink on a resilient roller surface wherein the metering member is to be positioned such that the leading edge of the metering member is urged to indent the resilient roller surface when the metering member is positioned generally tangent to the resilient roller surface, the metering member comprising: a hard, generally flat, elongated metallic strip having an upper surface and a lower surface; a side surface on the strip extending between and intersecting said upper and lower surfaces, a portion of said side surface and a portion of said lower surface adjacent said side surface being polished such that said side surface and said portion of the lower surface intersect to form an included angle of greater than 90° at an apex to form a straight, polished, first metering edge which is substantially free of surface irregularities, the lower surface of said elongated strip having a relieved area formed therein, said relieved area having a depth of at least 0.020 inch to leave a resilient metallic portion on said strip between the upper surface of the strip and the relieved area of approximately 0.030 inch and having a polished surface bonding the relieved area in the lower surface on the opposite side of the polished portion of the lower surface from the first metering edge, said polished surface bounding the relieved area in the lower surface being inclined relative to said polished portion of the lower surface at an included angle of at least 90° to form a second polished edge spaced from said first metering edge, said recessed area being formed to prevent engagement of the metering member with a metered film of ink on a resilient roller surface except by the portion of the metering member lying between the first and second polished edges.

4,538,519

WARHEAD UNIT

Wolfram Witt, and Manfred Moll, both of Duesseldorf, Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 8, 1984, Ser. No. 578,056

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306659

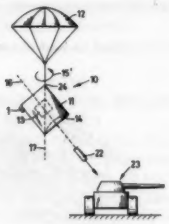
Int. Cl.[3] **F42B** *25/02, 11/28*

U.S. Cl. 102—387 **6 Claims**

1. An improved warhead carrying a pay load and having a parachute which brakes the descent of the warhead onto a target region, including a sensor for detecting a target and a projectile forming explosive charge, the improvement comprising,

that during the descent the pay load of the warhead is suspended from a parachute via a connecting member;

means for rotating the pay load about a first longitudinal axis; and



means for transferring the point at which said pay load is suspended via said connecting member from said parachute from a central region of said pay load to a corner region thereof.

4,538,520

GUN CARTRIDGE

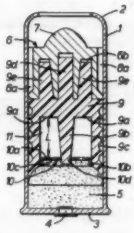
Alfons Schmitz, Hanover, Fed. Rep. of Germany, assignor to Wilhelm Brenneke KG, Fed. Rep. of Germany

Filed Nov. 7, 1983, Ser. No. 549,480

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1982, 3241149

Int. Cl.[3] **F42B** *11/00*

U.S. Cl. 102—439 **5 Claims**



1. A gun cartridge including a bullet including

a metal head having a pointed end and a rear face,

an elastically deformable first plug part connected to said rear face of said metal head, having wall means defining an interior open ended space, and having at least one tapering pin extending down through said space to said open end,

a second plug part positively connected to said open end of said first plug part to substantially close off said space, and defining an opening therein in which said tapering pin engages.

4,538,521
RECESSIBLE GUIDE RAIL ARRANGEMENT FOR A WHEEL-SUPPORTED VEHICLE

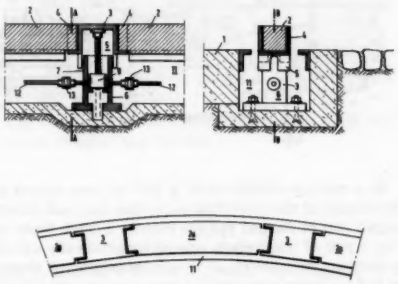
Werner Fastenau, Esslingen-Rüdern, Fed. Rep. of Germany, assignor to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 516,646

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1982, 3227795

Int. Cl.³ B61B *13/04*

U.S. Cl. 104—118 **11 Claims**



1. A recessible guide rail arrangement for guiding a wheel-supported vehicle in its movement along a roadway structure, the vehicle having flangeless wheels or the like for coacting with a side wall of the rail to laterally guide the vehicle along the roadway structure, the recessible guide rail arrangement comprising:

a plurality of guide rail segments arranged one behind the other to define the guide rail, the ends of each two mutually adjacent segments defining supporting locations of the guide rail;

a recess extending in the direction of travel on the roadway structure; and

a plurality of supporting devices mounted in said recess and arranged at respective ones of said locations along the guide rail, said supporting devices including holding means for receiving the respective end portions of the mutually adjacent segments therein to thereby hold and support said segments with respect to the roadway structure;

said supporting devices including elevation means for moving said guide rail between a first position whereat said guide rail is recessed in said recess and a second position whereat the guide rail is raised above the roadway surface for laterally guiding the vehicle therealong.

4,538,522
CABLE GRIPPING APPARATUS HAVING FORWARD AND REARWARD MOVEMENT CAPABILITIES

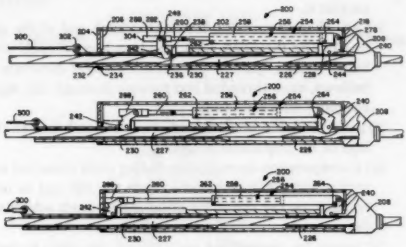
Douglas P. Kelley, Redmond, Wash., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 414,483, Sep. 2, 1982, abandoned. This application Feb. 5, 1985, Ser. No. 698,740

Int. Cl.³ B61C *11/02*

U.S. Cl. 104—287 **8 Claims**

7. An apparatus for moving along the length of an existing cable in a forward direction, comprising: main body means including first and second segments interconnected for limited slidable movement relative to one another; first and second cable gripping means respectively connected with said first and second segments of said main body means, each of said gripping means being movable between one position for gripping said cable and a second non-gripping position; an arrangement including means movable in a predetermined way for causing said first and second gripping means to alternately grip said cable and for causing said first and second segments of said main body means to slide relative to one another such that said main body means is caused to move in a forward direction along said cable; and rope means connected with said main body means and cooperating with said arrangement such that pulling said main body rearwardly by said rope means at a



particular point in the predetermined movement of said movable means causes both of said gripping means to be held in a non-gripping positions simultaneously whereby continued rearward pulling of said main body means by said rope means causes said main body means to move rearwardly with said rope means.

4,538,523
BELLOWS FOR ARTICULATED VEHICLES

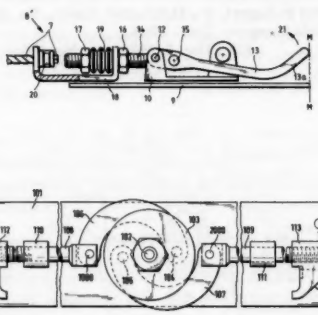
Robert Koch, Bad Sooden-Allendorf, Fed. Rep. of Germany, assignor to Hubner Gummi-Und Kunstsoff GmbH, Kassel-Bettenhausen, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,198

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130361; Oct. 6, 1981, 3139697

Int. Cl.³ B61D *17/20*

U.S. Cl. 105—20 **4 Claims**



1. For use with a bellows employed between the opposed end faces of two pivotally interconnected vehicle sections, each end face having a groove extending substantially circumferentially around it, the bellows including at each of its ends a flexible but non-stretchable cable extending circumferentially around the bellows, the cable being sized to be accommodated within one of the grooves:

means for tensioning the cable after it is placed in the groove so as to attach the end of the bellows to one of the vehicle sections, the tensioning means comprising:

(a) a base plate,

(b) two brackets fixed to the base plate, the brackets being spaced apart in the circumferential direction of the bellows,

(c) a handle pivotally mounted on each bracket, each handle

being pivotable about an axis fixed with respect to the bracket which carries it,

(d) a threaded rod pivotally secured at one of its ends to each of the handles, the pivot connection between each rod and its respective handle being movable with the handle when the handle moves with respect to the bracket which carries it,

(e) a U-shaped coupling for joining each end of the cable to one of the threaded rods, the two legs of each coupling being spaced apart in the circumferential direction of the bellows, each threaded rod passing through one leg of the coupling allocated to it,

(f) a nut threaded on each rod in a location between the two legs of its respective coupling,

(g) a compression spring surrounding each threaded rod, the spring bearing at one end against the nut and at its other end against the leg of the coupling through which the rod passes, and

(h) means for connecting each end of the cable to the other leg of the coupling closer to it, the connection being readily disengageable when the cable is slack so as to permit disconnection of the bellows from the tensioning means,

(i) each handle being pivotable between one extreme position, in which the fixed pivot is between the movable pivot and the coupling and the cable is tensioned, and another extreme position, in which the movable pivot is between the fixed pivot and the coupling and the cable is slack.

2. Cable tensioning means as defined in claim 1 including a second nut threaded on to each threaded rod, the second nut being located between the movable pivot, connecting that rod to its handle and the leg of the coupling through which that rod passes.

4,538,524

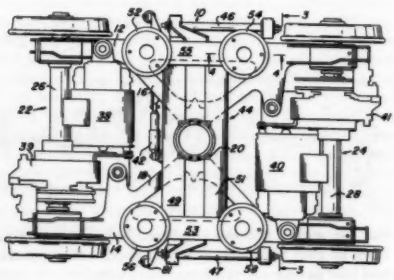
EQUALIZATION MEANS FOR A RAILWAY TRUCK

Walter S. Eggert, Jr., Huntington Valley, Pa., assignor to The Budd Company, Troy, Mich.

Filed Dec. 8, 1983, Ser. No. 559,551

Int. Cl.³ B61F 5/52

U.S. Cl. 105—182 R **9 Claims**



1. In a railway truck including wheel-axle units having wheels and axles for carrying a car body,

(a) a pair of side frames for receiving the axles of said wheel axle units;

(b) a pivot assembly mechanism connected between the centers of said side frames to permit pivotal movement thereof about an axis parallel to said axles; and

(c) spring means disposed between said support structure and said side frames to provide equalization of the wheels of said wheel-axle units.

4,538,525

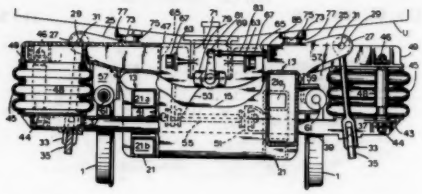
FOUR-WHEEL PASSENGER CAR TRUCK

Keith L. Jackson, Granite City, and James J. Reece, Belleville, both of Ill., assignors to Lukens General Industries, Inc., St. Louis, Mo.

Filed Apr. 25, 1983, Ser. No. 487,979

Int. Cl.³ B61D 5/04, 5/30

U.S. Cl. 105—190 R **6 Claims**



1. In a railway vehicle truck, a pair of axles spaced apart longitudinally of the truck from each other and each mounting a gauged pair of flanged railway wheels, a truck frame comprising a pair of transversely spaced longitudinally extending side members each having end portions positioned above the axles and resiliently supported thereon transversely inboard of said wheels and a central portion depressed to a lower level than said end portions and a pair of longitudinally spaced transversely extending transom members rigidly connected to said side members adjacent the depressed center portion thereof and being formed with upward and outward extensions projecting above said side members and outwardly therefrom a substantially greater distance than the outer surfaces of said wheels, the outer extremities of said extensions being formed as clevises, depending transversely swingable hangers pivotally mounted in said clevices, said side members being formed with a longitudinally elongated aperture in their depressed portions, a transversely extending spring plank passing through said apertures and being supported near its ends from said swing hangers, upright spring devices supported on the ends of said spring plank, a transversely extending bolster carried at its ends on said upright spring devices and extending over the depressed center portion of said side members, and means preventing substantial movements of said bolster longitudinally of the truck with respect to said truck frame while accommodating lateral and vertical movements therebetween as permitted by said swing hangers and upright spring devices, and means connecting said bolster and said spring plank to each other to prevent substantial transverse movements therebetween while accommodating vertical movements permitted by said upright spring devices.

4,538,526

TABLE FRAME ASSEMBLY

Frederic F. Seeley, St. Marys, Australia, assignor to F. F. Seeley Nominees Pty. Ltd., St. Marys, Australia

Filed Mar. 28, 1983, Ser. No. 479,642

Claims priority, application Australia, Mar. 29, 1982, PF3346

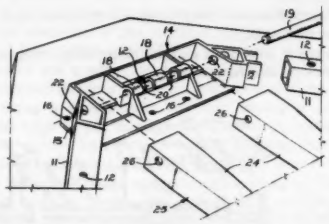
Int. Cl.³ A42B 13/06

U.S. Cl. 108—127 **8 Claims**

1. A table frame assembly for supporting a table top, comprising four tubular frame members each of square cross-sectional shape, arranged in a rectangular configuration, four stay brackets, means for securing the frame members and further means for securing the stay brackets to the under surface of the table top,

four end brackets each arranged diagonally with respect to the frame members and secured to the under surface of the table top, each having a pair of outstanding spigots receiving adjacent ends of, and retaining, two respective said frame members, each end bracket also having a hinge pin extending diagonally with respect to the frame members,

four legs each hinged to a respective said end bracket by its said hinge pin, and four articulated links each connected at



one end to a respective said leg and at its other end to a respective said stay bracket.

4,538,527

SECURITY SYSTEM

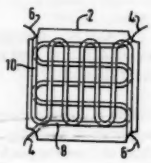
Cedric A. Kitchen, Whitford Holywell, Wales, assignor to Pilkington P.E. Limited, England

Filed Sep. 22, 1982, Ser. No. 421,412

Claims priority, application United Kingdom, Oct. 9, 1981, 8130572

Int. Cl.³ G08B *13/18*

U.S. Cl. 109—21 **18 Claims**



1. A composite wall panel comprising at least two fibre optic elements rigidly contained within a symmetrical block of material having a regular polygonal panel face comprising parallel edges, bisectors of said edges defining axes of symmetry of said face and fibre optic elements arranged within portions emerging from said blocks at spaced locations whose relative positions are such that when a plurality of said blocks are assembled together to form a security wall or housing having a number of transmission lines comprising said fibre optic elements within the wall or housing, said blocks cannot be moved relative to one another by translatory movement, rotation or tilting so as to provide access through the security wall or housing without also causing translatory movement of at least one emergent portion of one of said fibre optic elements wherein the improvement lies in that each end of one fibre optic element emerges from said block at a respective one of a first pair of spaced locations and each end of a second fibre optic element emerges from said block at a respective one of a second pair of spaced locations, the relative arrangement of the spaced locations being such that there are at least three spaced locations arranged symmetrically about at least one of said axes of symmetry of said panel face and the construction of said block being such that an unlimited number of said blocks can be assembled in juxtaposition to form a wall or housing and any relative movement between said blocks when assembled results in a translatory movement of the emergent portion of at least one of said fibre optic elements ensuring interruption of a transmission line in that wall or housing.

4,538,528

GAS CONVERTER

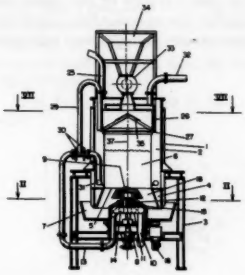
Erich Faehnle, Aalen, Fed. Rep. of Germany, assignor to PKA Pyrolyse Kraftanlagen GmbH, Aalen, Fed. Rep. of Germany

Filed May 16, 1984, Ser. No. 610,677

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3317977

Int. Cl.³ F23K *1/00*

U.S. Cl. 110—229 **13 Claims**



1. A gas converter for subjecting a reactant gas produced by any of various thermal reactions, such as the pyrolysis of waste materials, to a high temperature cracking or dissociation reaction which comprises: a vertical, tubular reactor; means at the upper end of said reactor for introducing a particulate solid fuel; grate means at the lower end of said reactor for supporting a column of said fuel; an open-top annular slag pan positioned at the lower end of said reactor beneath said grate for receiving slag produced by the combustion of said solid fuel; a distributor member cooperating with the wall of said reactor to form an annulus through which slag can pass downwardly into said slag pan; means for introducing combustion supporting air and reactant gas to said reactor to an area adjacent the underside of said distributor member, said distributor member serving to direct a mixture thereof outwardly towards said annulus through which it passes upwardly into said solid fuel column; and means at the upper end of said reactor for discharging gaseous reaction products formed by the high temperature cracking of the reactant gas.

4,538,529

GARBAGE INCINERATOR

Sedat Temelli, Erkrath, Fed. Rep. of Germany, assignor to Vereinigte Kesselwerke AG, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 575,046, Jan. 30, 1984, , which is a continuation of Ser. No. 309,129, Oct. 5, 1981, abandoned. This application Jul. 12, 1984, Ser. No. 631,944

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038875

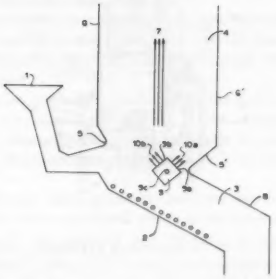
Int. Cl.³ F23G *3/00*

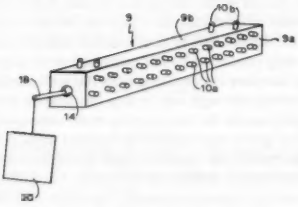
U.S. Cl. 110—244 **24 Claims**

1. In a garbage incinerator, comprising a combustion grate, inlet passage means for feeding garbage onto said combustion grate, wall means forming a combustion chamber above said grate and an upwardly projecting flue connected to said combustion chamber so that a stream of flue gases passes from said combustion chamber through said flue; the improvement comprising nozzle box means for blowing secondary air streams at high speed into said stream of flue gas, said wall means further including a transition zone between said combustion chamber and said flue, said nozzle box means being positioned within said wall means and in said transition zone, said nozzle box means being provided with blower means for supplying secondary air into said nozzle box means, said nozzle box means extending horizontally over the entire width of said combus-

tion chamber and including a plurality of nozzles distributed over the entire length of said nozzle box means and being closely arranged relative to each other, at least some of said nozzles having axes being oriented to direct air streams at high speed, in a direction transverse to the stream of flue gases.

13. A garbage incinerator, comprising a combustion grate; inlet passage means for feeding garbage onto said combustion grate; wall means forming a combustion chamber above said grate; an upwardly projecting flue connected to said combustion chamber so that a stream of flue gases passes from said combustion chamber through said flue; nozzle means for blowing secondary air streams at high speed into said stream of flue





gas, said wall means further including a transition zone between said combustion chamber and said flue, said nozzle means being positioned within said wall means and in said transition zone, said nozzle means being provided with blower means for supplying secondary air into said nozzle box means, said nozzle means including at least one elongated hollow box-shaped member having an axis of elongation extending horizontally, said member projecting over the entire width of said combustion chamber and including a plurality of nozzles distributed over the entire length thereof and being closely arranged relative to each other, at least some of said nozzles having axes being oriented to direct air streams at high speed, in a direction transverse to the stream of flue gases.

4,538,530

BURNER FOR THE SUSPENSION FIRING OF COMMINUTED MATERIAL

John E. Whitman, 921 Lakeridge Dr., Olympia, Wash. 98502

Filed Dec. 31, 1979, Ser. No. 108,584

Int. Cl.[3] F23C *1/02, 1/04*

U.S. Cl. 110—260 **12 Claims**

1. A burner head comprising:

a. A first means for directing a flammable gas in an outwardly direction;

b. a second means for directing a cooling gas toward said flammable gas;

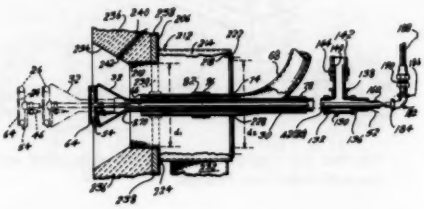
c. a third means for directing a comminuted combustible material toward said gas;

d. said first means comprising an igniter ring having a number of first peripheral orifices;

e. a means to introduce said flammable gas to said igniter ring;

f. said second means comprising a housing having a number of second orifices;

g. a means to introduce said gas comprising oxygen into the interior of said housing;



h. said igniter ring being positioned adjacent to said housing;

i. said first orifices and said second orifices being so positioned as to direct said flammable gas and said gas comprising oxygen toward each other; and

j. said third means comprising a means to direct said comminuted combustible material on the outside of said housing and toward said gas comprisng oxygen.

4,538,531

OLEFIN POLYMER BARRIER FILMS AND METHODS FOR USE THEREOF

Nang C. Wong, Fresno, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 401,590, Jul. 26, 1982, abandoned. This application Jul. 27, 1983, Ser. No. 517,538

Int. Cl.[3] A01C *1/00*

U.S. Cl. 111—1 **10 Claims**

1. A method of confining a volatile gaseous soil fumigation compound to areas of application and adjacent areas desired to be treated, which method utilizes for such purposes an olefin polymer film selected from the group consisting of polypropylene, low density polyethylene ("LDPE"), linear low density polyethylene ("LLDPE"), blends of LPDE with LLDPE, blends of high density polyethylene ("HDPE") with LLDPE and blends of HDPE and LDPE with LLDPE, the blends having a majority of LDPE or LLDPE, the olefin polymer film comprising a derivative compound of a fatty acid, the fatty acid having 12 to 24 carbon atoms, selected from the group consisting of fatty acid monoamides, fatty acid bisamides, fatty acid amines and fatty acid esters of polyols, present in an amount such that the diffusion of the volatile gaseous soil fumigation compound through the olefin polymer film is reduced by at least 10 percent compared to the same olefin polymer film not containing such fatty acid derivative compounds.

4,538,532

ANHYDROUS AMMONIA FERTILIZER APPLICATOR

Clyde R. Coker, Rte. 1, Rosebud, Tex. 76570

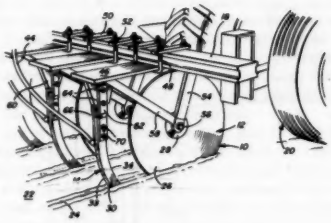
Filed Oct. 13, 1983, Ser. No. 541,415

Int. Cl.[3] A01L *23/00*

U.S. Cl. 111—7 **1 Claim**

1. An applicator for discharging flowable anhydrous ammonia fertilizer below the surface of soil comprising a supporting structure adapted to be mounted from a tractor type vehicle for movement over the soil surface at an adjustable elevational relationship thereto, a generally circular coulter rotatably supported from the supporting structure for forming a narrow slot in the soil surface, a knife supported from the supporting structure in trailing aligned relation of the coulter for movement through the slot in close trailing relation to the coulter,

and a conduit along the trailing edge of the knife, said conduit having a lower discharge end adjacent the lower end of the knife, said conduit being in communication with a supply of flowable anhydrous ammonia fertilizer for discharge thereof into the bottom of the slot formed by the coulter and knife to reduce the tendency of the fertilizer to "gas out", said knife having its lower edge generally in alignment with the lower periphery of the coulter for discharging the flowable anhydrous ammonia fertilizer in the bottom portion of the slot, said coulter being a substantially flat disc having a continuous peripheral edge to cut through surface debris, surface plants and below surface root systems thereby enabling the use of the apparatus in Bermuda grass fields, fields with crop residue and fields in minimum tillage procedures for applying anhydrous ammonia fertilizer below the soil surface, said supporting structure including a tool bar supporting a plurality of coulters and knives in spaced relation, and a plurality of bracket means adjustably mounted on the tool bar for supporting said coulters and knives therefrom, each of said bracket means including an elongated horizontal rectangular plate having its forward end secured in underlying relation to the tool bar, a pair of downwardly converging forward bracket members and a pair of downwardly converging rear bracket members with the forward and rear bracket members being rigid with the plate and converging toward each other and rigidly joined at their lower ends with the coulter including a hub received between the bracket members, an axle bolt extending through the hub and lower ends of the forward bracket members for rotatably journalling the coulter from the tool bar, each of said bracket means also including a depending mounting lug at the rear



center of said plate, a pair of bracket strap members attached to said lug along opposite surfaces thereof and depending therefrom for receiving the upper end of the applicator knife therebetween, bolt means securing the upper end of the applicator knife between the bracket strap members to enable replacement and removal thereof, each of said applicator knives comprising an elongated bar having a rectangular cross section with the narrow edges facing forwardly and rearwardly and being in alignment with the coulter, said bar being arcuately curved and provided with a concave forward edge and a convex rearward edge with the concave forward edge being spaced from and generally paralleling a portion of the periphery of the coulter, a pair of U-bolts securing each plate to the tool bar with the U-bolts being disposed along the forward and rearward surfaces of the tool bar with the bight portion of the U-bolts receiving the plate, a pair of strap members overlying the tool bar and received on the upper threaded ends of the U-bolts to enable lateral adjustment of the plates and thus the coulters and discs along the tool bar, the bight portion of the forward U-bolt being received in the juncture between the forward bracket members and the plate to prevent rearward movement of the plate in relation to the tool bar, said rear bracket members being rigidly fixed to said plate in partially overlapping relation to the depending mounting lug whereby upward forces exerted on the mounting plate by the rear bracket members will counteract the downward forces exerted on that portion of the plate to which the rear bracket members are attached by the lug and the knife that is supported in depending relation thereto, said mounting lug having a thickness substantially greater than the thickness of the knife with the strap members having inwardly offset lower ends for surface-to-surface engagement with the knife, the lower ends of each of said strap members including a transverse aperture and a transverse slot vertically disposed above the aperture to receive mounting bolts having different spacings.

4,538,533

WORKPIECE HOLDING-DOWN DEVICE FOR A SEWING MACHINE

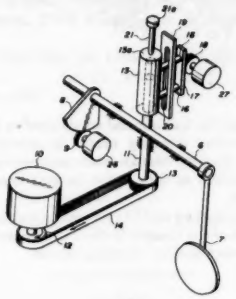
Torao Ohchi, and Hideo Yasui, both of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,858

Claims priority, application Japan, Sep. 30, 1982, 57-171588; Jul. 22, 1983, 58-113743[U]

Int. Cl.[3] D05B *69/28, 29/02*

U.S. Cl. 112—239 **4 Claims**



1. A workpiece holding-down device for a sewing machine comprising a vertically movable workpiece holding-down means including a vertical presser bar and a substantially horizontal presser foot pivoted to the lower end of said pressure bar; a drive mechanism for moving the presser foot; and a control mechanism for controlling said drive mechanism so as to position the presser foot in a controlled position; said drive mechanism comprises a motor, means operatively connected to said motor to convert the rotation of the motor into a linear movement and a linkage operatively connected to said conversion means to transmit said linear movement to said presser bar.

4,538,534

APPARATUS AND METHOD FOR PROCESSING HOSIERY BLANKS

Estill G. Frazier, Colfax, and William P. Kiger, Jr., Greensboro, both of N.C., assignors to Kayser-Roth Hosiery, Inc., Burlington, N.C.

Filed May 9, 1984, Ser. No. 608,361

Int. Cl.[3] D05B *97/00, 21/00*

U.S. Cl. 112—262.2 **14 Claims**

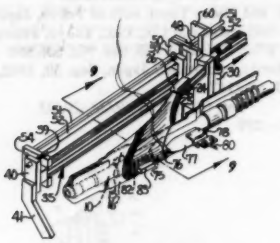
1. In an automatic hosiery toe closing machine including a plurality of elongate tubular hosiery carriers movable around an endless path, a toe seamer positioned at a fixed location adjacent the path of travel of said hosiery carriers, and a hosiery receiving station positioned in advance of said seamer location, the combination therewith of

(a) hosiery donning means positioned at said hose receiving station for automatically drawing successive hosiery blanks onto successive ones of said hosiery carriers as they move to said hosiery receiving station, and

(b) slitting means associated with said hosiery receiving station and being operable in response to movement of said hosiery donning means for longitudinally slitting the leading end of the hosiery blank as it is automatically drawn onto said hosiery carrier.

13. A method of processing hosiery blanks on an automatic hosiery toe closing machine in preparation for forming pan-

tyhose therefrom, said toe closing machine including a plurality of elongate tubular hosiery carriers movable around an endless path, a toe seamer positioned at a fixed location adjacent the path of travel of said hosiery carriers, a hosiery receiving station positioned in advance of said seamer location, hosiery donning means positioned at said hosiery receiving station, and slitting means associated with said hosiery receiving station, said method comprising the steps of



(a) positioning the leading end of successive hosiery blanks on said hosiery donning means to automatically draw successive hosiery blanks onto successive ones of said hosiery carriers as they move to said hosiery receiving station, and

(b) slitting the leading end of successive hosiery blanks as the leading end of the hosiery blank is drawn onto said hosiery carrier by said hosiery donning means.

4,538,535

SEWING MACHINE WITH UPPER THREAD DYEING MECHANISM

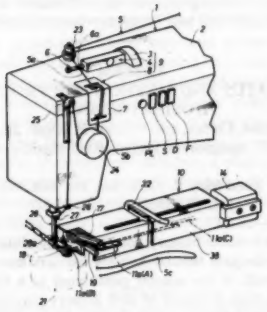
Susumu Hanyu, and Yoshio Yamaguchi, both of Hachioji, Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Japan

Filed Nov. 12, 1982, Ser. No. 441,308

Claims priority, application Japan, Nov. 11, 1981, 56-179829

Int. Cl.³ D05B *67/00*

U.S. Cl. 112—270 **4 Claims**



1. A sewing machine having a needle carrying an upper thread and a thread tension for normally applying a predetermined tension to the upper thread, said sewing machine comprising an upper thread dyeing mechanism for dyeing the upper thread with any color or any combination of different colors; an upper thread feeding mechanism operated to draw away from the needle a predetermined amount of the upper thread existing between said dyeing mechanism and said needle; and a switch connected to said tension device and to said feeding mechanism, said switch being operated to inactivate said thread tension device to release said tension from the upper thread and simultaneously operate said feeding mechanism, said dyeing mechanism being located a predetermined distance from said needle and being operative not only when the sewing machine is in stitching operation but also when said feeding mechanism is operated, whereby after completion of the operation of said feeding mechanism a segment of the upper thread having a desired color is properly positioned at a location in the pattern in which said segment is to appear.

4,538,536

OPTICAL APPARATUS FOR MONITORING FOR THREAD BREAKAGE

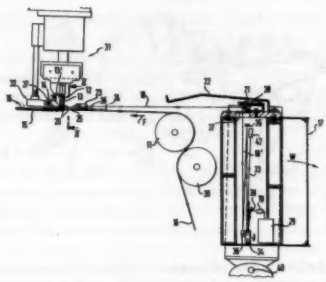
Erwin Sick, Icking, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed May 2, 1984, Ser. No. 606,306

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317323; Sep. 2, 1983, 3331772

Int. Cl.³ B65N *63/00*; D05B *69/63*

U.S. Cl. 112—273 **14 Claims**

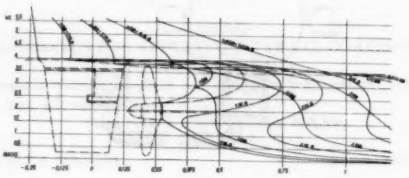


1. Optical apparatus for monitoring for thread breakage in tufting machines in which a carrier web is passed upwardly to a spiked roller and is deflected by the spiked roller into a substantially horizontal direction so that it can be passed under a row of needles which, in order to form tufted material, periodically introduces threads into the carrier web by up and down movement, said monitoring apparatus making use of a laser beam scanning device, characterised in that when the needles (13) are open a preferably narrow retroreflecting strip (14) is arranged directly below and behind the needle tips and directly above the tufted material (15), parallel to the row of needles (12) and substantially at right angles to the surface of the tufted material; and in that the laser beam scanning device (17) is arranged in front of the spiked roller (11), wherein said laser beam scanning device generates a scanning beam (18) which periodically scans the retroreflecting strip (14) and which extends substantially parallel to the part of the carrier web (16) extending between the spiked roller (11) and the row of needles (12) and at right angles to the retroreflecting strip (18), and wherein said laser beam scanning device contains a light receiver (19) operating in an autocollimating arrangement, said light receiver (19) being connected to an electronic fault evaluating circuit (29) which transmits a fault signal if a scanning beam interruption signal caused by the absence of a thread (20) extending through the needles (13) or between the needles (13) and the carrier web (16) is missing.

4,538,537
SHIP HULL FOR SINGLE-SCREW VESSEL, TWIN-SCREW VESSEL WITH TWO AFTBODIES AND CATAMARAN

Ernst A. Nönnecke, Professor-Brix-Weg 2, 2000 Hamburg 50, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 363,617
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116727
Int. Cl.³ B63B *1/08*
U.S. Cl. 114—57 9 Claims



1. In a hull for a ship having a single screw-propeller including a hull stern body formation which is nonsymmetrical in that the part of the stern lying above the propeller shaft extends inwardly counter to the direction of propeller rotation in relation to the part lying below the propeller shaft on only one side of said stern body so that in the zone of the propeller aperture the center lines of the horizontal sections through the hull are inclined away from the longitudinal medium plane of the ship in a direction counter to the direction of rotation of the propeller, this inclination increasing from the zone of the root of the propeller blades to that opposite the ends of the blades in such a way that, seen from the stern, the stern frame above the propeller shaft forms with the longitudinal median plane an angle inclined away from the direction of rotation of the propeller, the improvement comprising that:

said upper part is combined with a part of said hull below said propeller shaft, the sectional areas of which hull are twisted and have one of a U-shaped and bulbous configuration, said center lines of said sectional areas being inclined away from said longitudinal median plane through said propeller center in a direction opposite to that of said propeller rotation, said inclination increasing from the roots of said propeller blades to the ends of said blades in such a way that, when seen from aft, the stern below said propeller shaft forms an angle of inclination with said longitudinal median plane in a direction opposite to that of propeller rotation; and that

said sectional areas have S-shaped center lines which are fanned to one ship's side above said propeller shaft and to the other ship's side below said propeller shaft opposite to the direction of propeller rotation, said fanning effect increasing from the area of said propeller shaft outwards to the area of the propeller diameter in the aft direction to the stern.

4,538,538
STABILIZING APPARATUS FOR A CRAFT

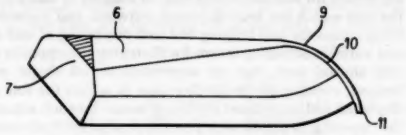
Claude Carbonel, 1 Rue Farjon, 13001 Marseille, France

Filed Feb. 12, 1982, Ser. No. 348,367
Claims priority, application France, Feb. 13, 1981, 81 03038
Int. Cl.³ B63B *43/06*
U.S. Cl. 114—125 6 Claims

1. A craft having a stabilizing device comprising:

a triangular, substantially flat base floor, said floor having a bottom on which said craft floats when at rest and forming the top of said stabilizing device; and

a V-shaped hull having sides connected to said flat base floor and extending below said bottom of said floor to form the sides of said stabilizing device, said flat base floor bottom extending from one side to the other side of said V-shaped hull, said flat base floor and said sides of said V-shaped hull defining a space extending completely across the bottom of said floor and being fully open at the rear of said

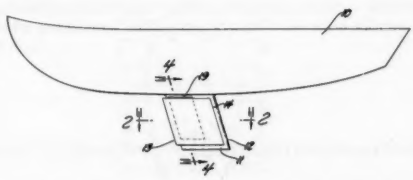


craft so that said space is substantially filled with water when said craft is at rest.

4,538,539
DEFORMABLE SHROUDED WATER FOIL

David E. Martin, 27786 Rainbow Cir., Lathrup Village, Mich. 48076

Filed Mar. 20, 1984, Ser. No. 591,504
Int. Cl.³ B63B *3/38*
U.S. Cl. 114—140 6 Claims



1. An underwater appendage for a sailboat of the type having a hull and at least one underwater appendage, said appendage comprising: a core portion being substantially keel-shaped having mounting means to said hull, a shell-like foil-shaped flexible outer shroud placed around the said core which shroud has a rounded front portion descending parallel to the front edge of the core appendage, with free space between the core and the rounded front of the shroud, and with the two sides of said shroud enveloping the opposite sides of said core, with the upper and lower edges of said shroud being essentially horizontal and with the upper edge being close to the bottom of said hull, and the lower edge being nearer to the bottom of said core, with said shroud being disposed such that the sides of the shroud are essentially parallel to the core, and spaced outward from it, such that the distances of the outer shroud sides from said core is substantially constant along a line parallel to the descending axis of said core but which distance gradually diminishes toward the rear descending edge of said core such that the opposite sides of the shroud join their respective sides of the core near the rear descending edge of the said core with there being mounting means for both rear edges of said foil shroud to the said core where said shroud joins said core, forming an outer foil shaped shroud in a position such that the incidence of said foil is substantially parallel to the fore/aft axis of the boat in the undeformed symmetrical condition of said shroud and cross sections of said foil in any horizontal plane having a rounded front incidence portion tapering toward the rear edge such that a hydrofoil shape is formed by said shroud and a space exists between said shroud and the core at all points on the inside surface of said shroud except where it has mounting means along its rear edge where it joins the said core, said mounting means being the only attachment of said shroud such that said spaces provide space for displacing the forward round descending portion of the shroud to either side of said core, and space for the corresponding side of the shroud to displace in the same direction, except for the rear fixed edge of such side, and space for the opposite side of said

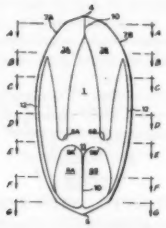
shroud to displace inward toward said core, creating an incidence angle between the axis of said foil shroud and the fore-/aft axis of said boat, and said space receiving variable actuating means for said displacing and for bulging of said shroud on the side which has been displaced outward, and variable actuating means for said bulging and said displacing of said shroud and variable actuating means for flattening the opposite side of said shroud such that an asymmetrical foil shape may be formed, creating lift in the direction in which the foil is both displaced and bulged and reversing means for such actuation in the opposite direction such that the desired hydrodynamic lift may be created on the opposite side of the appendage, said variable means also adjusting the shroud to a symmetrical foil when no lift is desired.

4,538,540

HULL CONSTRUCTION

Raymond Cashmere, 42 Kulai St., Charlestown, New South Wales 2290, Australia

Filed Feb. 16, 1984, Ser. No. 580,942
Claims priority, application Australia, Feb. 21, 1983, PF8117
Int. Cl.³ B63B *1/32*
U.S. Cl. 114—288 **8 Claims**



1. A hull construction incorporating:
a pair of air intake chambers one on either side of the longitudinal axis of symmetry of the hull and symmetrical thereabout each said air intake chamber having a mouth at the forward end of the hull and being constituted by a longitudinal groove in the hull surface each said groove extending longitudinally of the hull towards the following end thereof, generally decreasing in cross-section towards the said following end and extending over more than half the hull length,
a pair of vacuum chambers at the following end of the hull one on either side of the longitudinal axis of symmetry of the hull and symmetrical thereabout, each said vacuum chamber being constituted by a groove in the hull surface, each said groove extending longitudinally of the hull from the following end towards the forward end thereof and terminating in an arc; and
a section of ungrooved hull surface between the respective ends of the air intake chambers and the vacuum chambers.

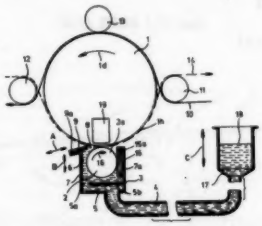
4,538,541

METHOD OF AND APPARATUS FOR APPLYING A UNIFORM LAYER OF LIQUID TO A SURFACE

Johannes Zimmer, Ebentalerstr. 133, 9020 Klagenfurt, Austria

Filed Mar. 29, 1983, Ser. No. 480,113
Claims priority, application Austria, Mar. 29, 1982, 1197/82
Int. Cl.³ B05C *1/08*
U.S. Cl. 118—258 **11 Claims**

1. An apparatus for applying a liquid layer of controlled thickness to a surface comprising:
a trough open in the direction of said surface and having a pair of opposite lateral walls relatively spaced apart from one another;
means for feeding said liquid to said trough;
a liquid-applying roller rotatable in said trough and extending the full width of said surface in said trough and in contact with one of said walls for transferring said layer of liquid from said roller to said surface, said roller having a liquid-transfer face of textured configuration;
means on the other of said walls limiting access of air to liquid in said trough; and



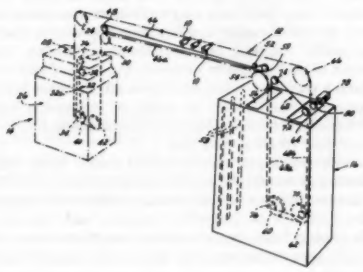
a yieldable pad on said one of said walls directly contacting said roller for preventing entrainment of air by said roller into liquid in said trough, said means on said other wall including a wiper engaging said surface and extending toward the region of contact of said roller with said surface to define a gap with said roller through which liquid is permitted to contact said surface, said pad being a brush having bristles engaging said roller.

4,538,542

SYSTEM FOR SPRAY COATING SUBSTRATES

James L. Kennon, Lorain; Richard Sieminski, Elyria; John Sharpless, Oberlin, and Donald Scharf, Amherst, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jul. 16, 1984, Ser. No. 631,403
Int. Cl.³ B05B *13/02*
U.S. Cl. 118—302 **10 Claims**



1. A system for spray coating a substrate with a liquid coating material containing particles of a film-forming material in a liquid vehicle, said system comprising, in combination,
a coater including a coating chamber for receiving the substrate to be coated,
spray nozzle means in said chamber for dispensing a spray of said liquid coating material onto said substrate,
a chamber for heating said liquid coating material on said substrate to evaporate said liquid vehicle to form a substantially dry film of said material on said substrate,
transport means for moving said substrate into said coating chamber, into proximity to said spray nozzle means for coating by said spray nozzle means, out of said coating chamber, and into said chamber for heating said liquid coating material on said substrate, and
overspray control means for containing and conveying the

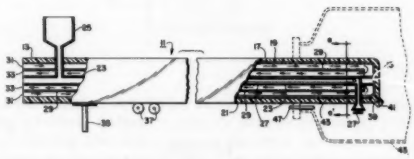
airborne overspray from said coating chamber, said overspray control means comprising a particle collector for collecting the particles of film-forming material in said overspray, means for drawing the airborne overspray from said chamber and to said collector, and duct means connecting said particle collector to said coater for containing said overpray as it moves from said chamber to said collector, said particle collector being spaced from said coating chamber a sufficient distance such that said particles of film-forming material are substantially dried on reaching said collector.

4,538,543

APPARATUS FOR APPLYING INTERNAL COATINGS IN HOT VESSELS

Erwin J. Nunlist, Penfield, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Filed Nov. 5, 1984, Ser. No. 668,594
Int. Cl.³ B05B *1/06, 7/20*
U.S. Cl. 118—308 **8 Claims**



1. An apparatus for feeding particulate vitreous material into a horizontal, rotating article maintained at a temperature of at least 1500° F., to coat the interior of said article comprising:

an elongated rigid outer tube having a downstream end adapted to be directed into the interior of the article to be coated;

said outer tube enclosing therein an elongated, rigid, feed tube having a means of receiving and transporting a supply of finely divided vitreous material therethrough;

a distribution means positioned in the downstream portion of said outer tube, adapted to distribute finely divided vitreous material;

a connection between said inner feed tube and said distribution means to allow a flow of finely divided vitreous material through said feed tube into said distribution means;

a cooling duct formed by an elongated, rigid tube positioned intermediate said outer tube and said inner feed tube adapted to receive and circulate a supply of cooling medium therethrough; and

said outer tube having a layer of low mass insulation thereon, and said layer of insulation having an outside reflective surface.

4,538,544

MACHINE FOR SURFACING FLOORS

Peter Pertl, Tulpenweg 3, 8200 Rosenheim, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 536,777
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1982, 3236686; Oct. 4, 1982, 3236688; Feb. 10, 1983, 3304632; Feb. 10, 1983, 3304639; Oct. 4, 1983, 3236687
Int. Cl.³ B05C *11/02*
U.S. Cl. 118—665 **20 Claims**

1. In a machine for surfacing floors by spreading a floor covering material and forming such material on said floor, of the type comprising a supporting and load bearing base, a pivoting boom mounted on said base for pivoting motion about a generally upright axis at said base, said boom being made up of articulated links with upright pivot axes therebetween, a floor working head mounted on an end of said boom furthest from said base, and first and second boom leveling units on said base for acting in planes at a right angle to each other, the improvement comprising bracing means joined to said base and cooperating with at least one floor, said first and second leveling units being arranged for movement relative to said bracing means of said base and including an adjustment and support

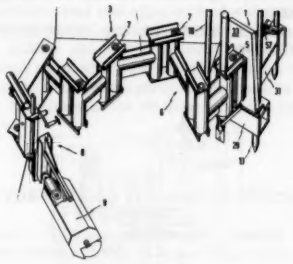


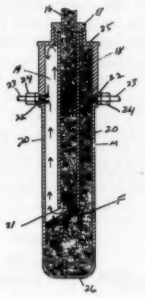
plate pivotally joined to said base and means connecting said adjustment and support plate to said boom for leveling said boom in generally all positions thereof about said base, and a height adjustment means located proximate said floor working head for positioning said head at a desired elevation relative to said floor.

4,538,545

FOAM GENERATING AND DISTRIBUTING MANIFOLD APPARATUS

Donald C. English, and Bruce W. Hicks, both of Rio Linda, Calif., assignors to Rio Linda Chemical Co., Inc., Sacramento, Calif.

Filed Jul. 11, 1984, Ser. No. 629,778
Int. Cl.³ B05C *5/00*
U.S. Cl. 118—679 **14 Claims**



1. A foam generating and distribution apparatus, comprising:

a foam generating chamber defined by top, bottom and side walls,

ingress means provided in said top wall of said chamber to receive therethrough pressurized gas and a liquid,

a frothing conduit surrounding said ingress means and extending downwardly therefrom into said chamber to conduct and mix said gas and said liquid to generate foam,

egress ports in fluid communication with said chamber annularly disposed through said side walls substantially above the lower termination point of said frothing conduit, and

supply conduits in fluid communication with said egress ports having on an opposed end distribution ports to distribute said foam.

4,538,546

CHARACTERS TO A HOT STEEL BODY

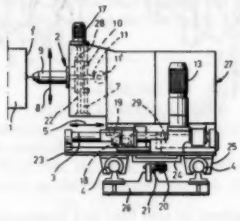
Dieter Baron, Hünxe, Fed. Rep. of Germany, assignor to INTERO-Stahl - und Maschinenbau Schmitz GmbH & Co. KG, Hünxe, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,418

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244210

Int. Cl.[3] **B05B** *3/00, 7/16, 15/00, 15/10*

U.S. Cl. 118—697 **5 Claims**



1. An apparatus for inscribing alphanumerical characters on a face of a body of steel heated to an elevated temperature, comprising:

a support;

a carriage movable on said support in a first dimension parallel to said face;

a working head movable on said carriage in a second dimension parallel to said face;

an elongated nozzle on said working head perpendicular to a plane defined by said first and second dimensions, said nozzle projecting toward said face;

first reversible drive means for displacing said carriage in said first dimension;

second reversible drive means for displacing said working head in said second dimension;

feed means for passing a wire of metallic marking material, of contrasting appearance with reference to steel, through said nozzle toward an outlet thereof confronting said face;

melting means at said nozzle for atomizing a leading end of said wire in the vicinity of said outlet;

blower means discharging into said nozzle for generating a jet of molten particles of said marking material trained from said outlet upon said face; and

control means coupled with said first and second drive means and with said feed means for displacing said working head to trace selected alphanumerical characters by said jet on said face while modulating the advance of said wire to discontinue the deposition of said marking material on said face at least after the tracing of each character.

4,538,547

FISHTANK

Luis Del Rosario, 5524 San Fernando Rd., Glendale, Calif. 91203

Filed Mar. 23, 1984, Ser. No. 592,942

Int. Cl.[3] **A01K** *64/00*

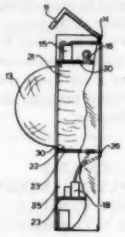
U.S. Cl. 119—5 **8 Claims**

1. A fish tank comprising a rigid self supporting structure including a base and side walls defining the shape of the major volume of a fish tank and having sufficient structural strength to support the volume of water to be contained within the fish tank;

said rigid structure having an opening in at least one of the side walls thereof to define at least one window for viewing fish within the fish tank;

a flexible bag of water impervious material dimensioned generally to fill a space within said rigid structure and with said structure defining a dark background within the tank and providing an appearance of depth;

said flexible bag including a rigid transparent window positioned to correspond with the opening in said rigid structure and extending outward through said window whereby said bag, when within said rigid structure, may



be filled with water and is supported by said rigid structure and the interior of said bag may be viewed through said window.

4,538,548

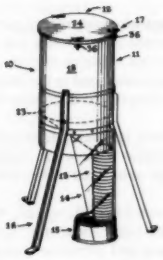
GRAVITY FEED DOG FEEDER

Aime R. Page, 17 Elm St., Proctor, Vt. 05765

Filed Jul. 10, 1984, Ser. No. 629,380

Int. Cl.[3] **A01K** *5/00*

U.S. Cl. 119—52 R **1 Claim**



1. A gravity feed pet feeder apparatus consisting of:

an elevated, elongated, cylindrical food reservoir having a plurality of elongated angled support legs attached to the bottom of the cylindrical food reservoir for supporting said food reservoir in an elevated position;

an off-set tubular chute in open communication with the interior of said food reservoir; wherein said food reservoir further comprises: a funnel member wherein the inlet of the funnel insert member conforms to the wall of the cylindrical food reservoir, and the outlet of the funnel insert member is dimensioned and disposed to be in open communication with said off-set tubular chute;

a bowl element disposed beneath the outlet of said tubular chute;

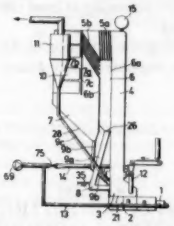
a circular lid element adapted to engage and extend beyond the periphery of the cylindrical food reservoir; and,

a shield element extending between, and connected to, the cylindrical food reservoir and the bowl element; wherein said shield element is transparent and extends around a portion of the periphery of the cylindrical food reservoir and the bowl element in a cowl like fashion.

4,538,549
FAST FLUIDIZED BED BOILER AND A METHOD OF CONTROLLING SUCH A BOILER

Lars A. Strömberg, Nyköping, Sweden, assignor to Studsvik Energiteknik AB, Nyköping, Sweden

PCT No. PCT/SE83/00089, § 371 Date Oct. 14, 1983, § 102(e) Date Oct. 14, 1983, PCT Pub. No. WO83/03294, PCT Pub. Date Sep. 29, 1983
PCT Filed Mar. 15, 1983, Ser. No. 552,130
Claims priority, application Sweden, Mar. 15, 1982, 8201632
Int. Cl.³ F22B *1/00*
U.S. Cl. 122—4 D 35 Claims



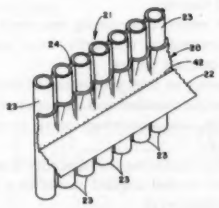
1. Fast fluidized bed boiler comprising a vertical reactor having a bottom section, a primary particle separator, a gas pass containing convective heat exchangers, and optionally a secondary particle separator, means for recirculating separated particles into the reactor bottom section, the boiler being a completely cooled and integrated design, the integrated primary particle separator being a non-centrifugal mechanical separator of a general labyrinth type, the reactor and the primary particle separator and the gas pass containing convective heat exchangers being built as a unit within one and the same cooling system.

26. A method of controlling a cooled fast fluidized bed boiler, the boiler comprising a reactor, a primary particle separator, a gas pass, and a bottom section of the reactor, the method comprising the steps of maintaining the temperature of the bed material of the reactor substantially constant or within a relatively narrow temperature interval by regulating the recirculation flow of separated particles dependent on the boiler load, thereby varying the particle density of the reactor and thus the heat transfer to the cooled walls of the reactor.

4,538,550
CASING SEAL ATTACHMENT

Kurt H. Haller, Akron, and Raymond G. Kidaloski, Canal Fulton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 4, 1984, Ser. No. 607,092
Int. Cl.³ F22B *15/00*
U.S. Cl. 122—235 G 5 Claims

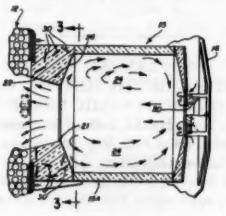


1. An improved transition seal arrangement for sealingly connecting a casing to a wall of a vapor generator, the wall being of the type having a plurality of parallel, laterally spaced tubes and a plurality of bars disposed between and weld united to adjacent tubes to define a wall surface with longitudinally extending circumferential surfaces and intervening planar surfaces, wherein the improvement comprises an elongated plate welded gas-tight to the wall along a lengthwise edge and weld connected gas-tight to the casing, the lengthwise edge having a plurality of arcuate saddles and protrusions formed in alternate succession along said edge, each of said saddles overlapping a circumferential portion of one of the tubes and wherein the saddles and the protrusions extend from the lengthwise edge, substantially parallel to the tubes, for a distance less than the width of the plate, the protrusions having a depth which diminishes as the distance from the lengthwise edge increases.

4,538,551
REFRACTORY CHOKE FOR A HIGH INTENSITY COMBUSTOR

Robert T. Brady, Elmhurst, and Harry L. Gardell, Hoffman Estates, both of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Jun. 20, 1984, Ser. No. 622,667
Int. Cl.³ F22B *23/06*
U.S. Cl. 122—367 R 6 Claims



1. A boiler comprising;

a shell, a high intensity combustor mounted in said shell, a coil bank in said shell, a fire pot defining a combustion chamber in said combustor, said fire pot fabricated of refractory material, a combustion throat at a first end of said fire pot, a choke having inner and outer diameters, in a position to be exposed to high temperature combustion gases, said gases establishing a steady state radial thermal gradient, said gradient decreasing from said inner to outer diameters, said choke being of refractory material consisting principally of the oxides and magnesium, aluminum, and silicon, and including stainless steel material for increasing the thermal conductivity of said refractory material and reducing said gradient, said metallic material uniformly distributed in said refractory.

4,538,552
PRIMARY AIR DUCT CLEANING APPARATUS FOR RECOVERY BOILERS

Robert T. Smuda, Enfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 3, 1984, Ser. No. 677,635
Int. Cl.³ F22B *37/48*; F23J *3/00*
U.S. Cl. 122—387 2 Claims

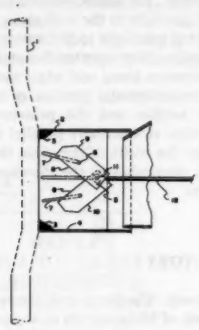
1. A scraper for removal of solidified layers of smelt on the furnace end of primary air ducts of rectangular cross section, including,

a pair of C-channel members having sharp edges and mounted in the air duct to initially extend substantially parallel to the longitudinal axis of the duct,

a pivot pin connecting the C-channel members at their upstream ends and extending transverse the duct,

guide pins mounted to extend from the outside surface of the C-channel members and extending transverse the duct,

a push-pull link attached to the pivot pin with which to reciprocate the C-channel members of the scraper along the air duct, and



grooves formed in the side walls of the duct and engaged by the guide pins and pivot pin to bring the sharp edges of the C-channel members of the scraper into contact with the sides of the duct to remove the solid smelt into the furnace.

4,538,553

MODE OF CONTROL OF THE HEATING CAPACITY OF A HYDRODYNAMIC BRAKE

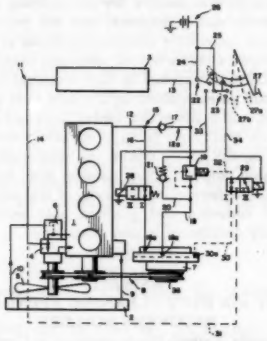
Wolf-Dieter Kurz; Hans Hanke, both of Stuttgart, and Andreas Braatz, Rutesheim, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 569,853

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301560

Int. Cl.³ F01P *3/12*

U.S. Cl. 123—41.13 **22 Claims**



1. A method of controlling the heating capacity of a hydrodynamic brake for a liquid cooled internal combustion engine controlled in response to movement of an acceleration pedal, the engine having a cooling circuit comprising at least one heat exchanger, a cooling medium circulating pump, the hydrodynamic brake serving as a heat exchanger and a pressure regulator valve means actuatable in response to movement of the acceleration pedal for regulating the state of charge of the hydrodynamic brake, the steps comprising

circulating the cooling medium through the cooling circuit, and

controlling the heating capacity of the hydrodynamic brake as a function of the load of the internal combustion engine by actuating at least the pressure regulator valve means by movement of the accelerator pedal.

11. Apparatus for controlling the heating capacity of a hydrodynamic brake for a liquid cooled internal combustion engine operably responsive to movement of an accelerator pedal, the engine having a cooling circuit comprising at least one heat exchanger, a cooling medium circulating pump, the hydrodynamic brake serving as a heat exchanger and a pressure regulator valve means for regulating the state of charge of the hydrodynamic brake,

means for controlling the heating capacity of the hydrodynamic brake as a function of the load of the internal combustion engine by actuating at least the pressure regulator valve means and

means for controlling the actuation of the pressure regulator valve means in response to movement of the accelerator pedal.

4,538,554

ARRANGEMENT OF BOILING LIQUID COOLING SYSTEM OF INTERNAL COMBUSTION ENGINE

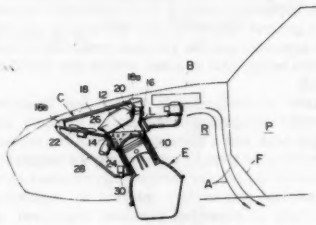
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Mar. 30, 1984, Ser. No. 595,524

Claims priority, application Japan, Apr. 13, 1983, 58-63788

Int. Cl.³ F01P *9/02*

U.S. Cl. 123—41.21 **7 Claims**



1. In a motor vehicle having an internal combustion engine mounted in an engine room thereof, a boiling liquid cooling system for cooling the engine by using a latent heat of coolant, comprising:

means defining in the engine proper a coolant jacket into which the coolant is introduced in liquid state and from which the coolant is discharged in gaseous state, said coolant jacket containing therefore liquid state coolant therein under operation of the engine leaving an unoccupied space at the upper portion thereof thereby to form a coolant level therein;

a rigid conduit member securedly mounted on the engine proper and extending upwardly from said unoccupied space of the coolant jacket;

a condenser having an inlet connected to the leading end of said rigid conduit member and an outlet positioned lower than said inlet, said condenser being mounted over the engine proper;

a conduit member extending downwardly from said outlet of the condenser to said coolant jacket at a position lower than said coolant level;

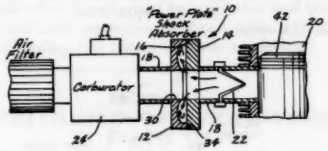
a pump mounted to said conduit member for pumping the liquefied coolant from the condenser into said coolant jacket below the coolant level; and

a rigid bracket member extending from the engine proper to support thereon said condenser.

4,538,555
POWER PLATE

John Kite, 7130 Airline Ave., Des Moines, Iowa 50322

Filed May 7, 1984, Ser. No. 607,425
Int. Cl.[3] F02B 75/18
U.S. Cl. 123—52 M 2 Claims



1. Apparatus for reducing and minimizing the effects of shockwaves and pressure differentials occurring in an intake manifold of an internal combustion engine, said engine having a combustion chamber communicating with the intake manifold and a carburetor, said carburetor having air passing therethrough to receive a material amount of fuel, all of which flows to the combustion chamber, the apparatus comprising:

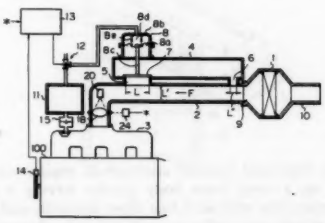
a plenum chamber means disposed intermediate adjacent spaced portions of the intake manifold at a location between the combustion chamber and carburetor and communicating directly with the intake manifold for absorbtion of shockwaves and pressure differential passing through the intake manifold,

said plenum chamber means including a first and a second plate, said plates being generally concentrically disposed about and having annular sections extending radially outwardly from the intake manifold and forming a circumferential chamber in said annular sections in communication along its inner circumference with the intake manifold via a slot, the first plate forming one side of the circumferential chamber having a contoured recess containing said slot comprising a curved surface in a direction facing away from said combustion chamber and the second plate forming an opposing substantially flat side of the circumferential chamber, the first and second plates being secured together and to the respective adjacent portions of the intake manifold in a generally air tight manner with said first plate being located between said carburetor and said second plate so as to enhance said absorbtion during back flow.

4,538,556
AIR INTAKE DEVICE OF AN INTERNAL COMBUSTION ENGINE

Keiso Takeda, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 26, 1984, Ser. No. 604,306
Claims priority, application Japan, Jul. 11, 1983, 58-124820; Aug. 24, 1983, 58-153019
Int. Cl.[3] F02B 75/18
U.S. Cl. 123—52 MB 7 Claims



2. An air intake device of an internal combustion engine having an air intake passage extending from an air cleaner to an intake manifold and a throttle valve in said intake passage, the device comprising:

tank means having a predetermined volume;

first pipe means defining a first passage interconnecting said tank means at one end of said tank means with said intake passage;

second pipe means defining a second passage interconnecting said tank means at an end opposite said one end of said tank means with said intake passage, said first and second passages opening to said intake passage at different locations with respect to each other, the locations of these openings being upstream of the throttle valve with the second passage opening being located nearer to said air cleaner than the first passage opening, and said; second passage having a cross-sectional area being smaller than that of said first passage;

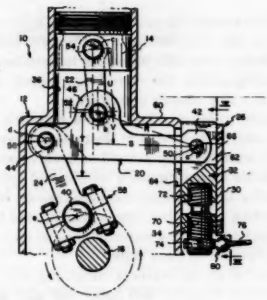
valve means disposed in said first passage; and

means for actuating said valve means in response to an engine operating condition.

4,538,557
INTERNAL COMBUSTION ENGINE

Rudolph R. Kleiner, 11 First St., Old Bridge, N.J. 08857; Raymond W. Kleiner, 1074 Appache St., North Brunswick, N.J. 08902, and Richard T. Bowie, Sr., 255B Oak St., Old Bridge, N.J. 08857

Filed Mar. 24, 1983, Ser. No. 478,477
Int. Cl.[3] F02B 75/04
U.S. Cl. 123—78 E 9 Claims



1. An internal combustion engine comprising:

an engine block defining at least one cylinder chamber;

a piston supported within the cylinder chamber for reciprocating movement therein between bottom and top positions;

a crankshaft rotatably supported by the engine block and including an eccentric portion;

a lever including first and second ends the first end of the lever being connected to the engine block for pivotal movement about a first pivot points;

a crankshaft connecting rod including a first end connected to the second end of the lever for pivotal movement about a second pivot point, and a second end connected to the eccentric portion of the crankshaft for pivotal movement about a third pivot point; and

a piston connecting rod including a first end connected to the piston for pivotal movement about a fourth pivot point, and a second end connected to an intermediate portion of the lever, between the first and second pivot points, for pivotal movement about a fifth pivot point fixed relative to the lever;

whereby reciprocating movement of the piston pivots the intermediate portion and the second end of the lever about

the first pivot point, and pivotal movement of the second end of the lever rotates the crankshaft; and

whereby the crankshaft rotates more than 180° as the piston moves from the top position to the bottom position and less than 180° as the piston moves from the bottom position to the position, and the piston has a longer dwell and a slower speed during movement from the top position to the bottom position than during movement from the bottom position to the top position.

4,538,558

VALVE ROTATING DEVICE

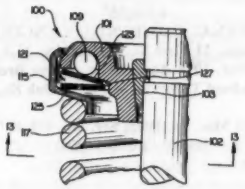
Stanley H. Updike, Painesville; William A. Michaels, Seven Hills, and Frederick L. Kuonen, Mentor, all of Ohio, assignors to TRW Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 214,800, Dec. 10, 1980, Pat. No. 4,425,882. This application Dec. 9, 1983, Ser. No. 559,931

The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.

Int. Cl.³ F01L *1/32*

U.S. Cl. 123—90.3 **9 Claims**



1. A valve rotator for rotating a valve in an internal combustion engine, the valve having a valve stem with a longitudinal axis and being rotatable about its longitudinal axis during a valve opening stroke, the valve being biased closed by a valve spring, said valve rotator comprising:

(a) a body to be attached to and rotatable with the valve stem, said body having at least one groove therein extending at least partially around said valve stem;

(b) shiftable means disposed within said groove;

(c) a collar for receiving the valve spring biasing force and encircling said valve stem adjacent said body, said body and said collar being movable in axial and rotational directions relative to each other;

(d) a pair of spring washers encircling said valve stem and interposed between said collar and said shiftable means,

(1) one of said spring washers having a portion bearing on said shiftable means and another portion bearing on said body when the valve is closed,

(2) the other of said spring washers acting between said collar and said another portion of said one spring washer bearing on said body and having a first portion which overlies said another portion of said one spring washer bearing on said body when the valve is closed and a second portion spaced at least in part from said one spring washer when the valve is closed,

(3) each of said spring washers having an inner circumference and an outer circumference, said overlying portions of said one and said other spring washers cooperating with each other adjacent the inner circumferences thereof to transmit surges of the valve spring from said collar through said overlying portions of said one and said other spring washers to said body to thereby isolate surges of the valve spring from said shiftable means, said second portion of said other spring washer engaging said one spring washer adjacent their outer circumferences when the valve spring biasing force exceeds a predetermined amount to transmit the valve spring biasing force to said shiftable means to thereby effect rotation of said body and the valve stem.

4,538,559

ENGINE CAM FOR USE IN INTERNAL COMBUSTION ENGINE

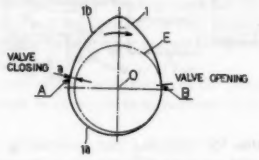
Toshio Imamura; Syouzo Kobayashi, and Yukihisa Hirano, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Aug. 30, 1983, Ser. No. 527,825

Claims priority, application Japan, Sep. 3, 1982, 57-152792

Int. Cl.³ F01L *1/08*

U.S. Cl. 123—90.6 **11 Claims**



1. A valve train for internal combustion engines of the type having overhead valves which are biased into a closed position by a spring biasing means and are actuated by pivoted rocker arm members which operatively contact a rotating camshaft having at least one cam, each cam having cam lobes and a base circle portion thereon, with the camshaft located over the rocker members, the improvement comprising:

said at least one cam being designed so that a radial distance from an outer circumference of the cam to the circumference of the base circle portion is gradually decreased from a valve closing point to a valve opening point, with respect to a rotating direction of the cam, thereby permitting a biasing force exerted by said spring biasing means upon said overhead valve to slowly decrease;

the rocker members having one end thereof contacting an end of the valve and having an intermediate portion contacting the outer circumference of the cam;

a stationary pivot means attached to the engine with the remaining end of the rocker member operatively connected to the pivot means; and

an hydraulic lash adjustment means for controlling the pressure exerted between the rocker arm and the cam and acting as a pivot means for the rocker arm, having a port means therein for receiving pressurized fluid from an engine lubricant supply.

4,538,560

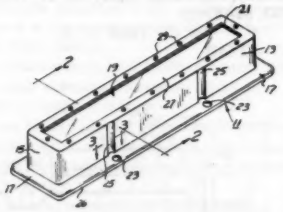
INTERNAL COMBUSTION ENGINE VALVE COVER

Lawrence S. Alden, 2504 Flower Rd., Venice, Fla. 33595

Filed May 30, 1984, Ser. No. 615,164

Int. Cl.³ F01M *9/10*

U.S. Cl. 123—90.38 **3 Claims**



1. An improved internal combustion engine valve cover comprising a metal main body portion having a generally rectangular form with sides that slope upwardly and inwardly from a planar outwardly extending bottom flange and that merge with a planar top having a coaxial generally rectangular

aperture formed therein with edges thereof parallel and generally equally spaced from the sides of said form exposing substantially all of an interior of said cover, a generally rectangular corresponding oriented clear plastic window over said aperture that is secured inside said cover to said top by removable fasteners, a down-turned lip on the peripheral edge of said flange, a plurality of perforations in said flange, a plurality of grooves in the sides of said main body portion said grooves being associated with respective perforations in said flange, and means for sealing said plastic window to said top.

4,538,561

VALVE ARM CHAMBER APPARATUS FOR DIESEL ENGINE

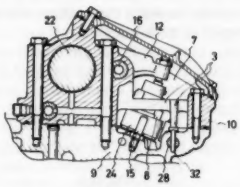
Koichi Amemori; Toshihiko Kawabe, both of Takatsuki, and Manabu Miyazaki, Ibaraki, all of Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Nov. 21, 1983, Ser. No. 553,897

Claims priority, application Japan, Jun. 20, 1983, 58-109300; Jun. 20, 1983, 58-109301; Jun. 21, 1983, 58-94172[U]; Jun. 29, 1983, 58-115790; Jun. 29, 1983, 58-115791

Int. Cl.³ F01L *1/46*

U.S. Cl. 123—90.44 **6 Claims**



1. In a diesel engine having a common cam shaft disposed above the intake and exhaust valves of said engine, said cam shaft carrying fuel cams for rocking fuel valve arms which drive unit injectors mounted in the cylinder head of said engine and intake and exhaust valve cams for rocking intake and exhaust valve arms for opening and closing said intake and exhaust valves of said engine, a valve arm chamber apparatus for diesel engines comprising a valve arm chamber member which supports said cam shaft and a fuel valve arm shaft for supporting said fuel valve arms and intake and exhaust valve arm shafts for supporting said intake and exhaust valve arms, said valve arm chamber being detachably mounted as a unit assembly with said shafts on said cylinder head.

4,538,562

ENGINE PART

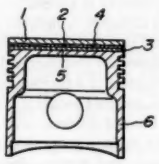
Minoru Matsui, Nagoya, and Nobuo Tsuno, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed May 6, 1983, Ser. No. 492,255

Claims priority, application Japan, Dec. 3, 1982, 57-211385

Int. Cl.³ F01L *1/14*

U.S. Cl. 123—90.51 **15 Claims**



11. A tappet for an internal combustion engine comprising:
a tappet body;
a ceramic member for contacting with a cam as a contact surface;
a metallized layer bonded to said ceramic member;
a plated layer applied to said metallized layer;
a metallic buffer disk having an effective thickness for reducing thermal stresses between said tappet body and said ceramic member, said metallic buffer disk being bonded to said plated layer, said metallic buffer disk having a coefficient of thermal expansion which is equivalent to or smaller than that of the ceramic member; and
said tappet body is integrally joined to said ceramic member with the metallic buffer disk, the plated layer, and the metallized layer disposed therebetween.

4,538,563

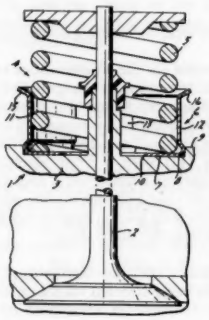
HELICAL COIL SPRING DAMPER ASSEMBLIES

Walter T. Mayers, West Bloomfield, Mich., assignor to Peterson American Corporation, Southfield, Mich.

Filed Sep. 4, 1984, Ser. No. 647,125

Int. Cl.³ F01L *3/10*

U.S. Cl. 123—90.67 **11 Claims**



1. A helical coil spring damper assembly comprising:
a helical coil spring interposed between a sprung member and an unsprung member, wherein said helical coil spring serves to return said sprung member to an initial position after release of an offsetting force;
a cylindrical sleeve member positioned in coaxial relationship to said helical coil spring, received by and conforming to a radial dimension of said helical coil spring in said initial position,
said cylindrical sleeve member extending over a portion of the axial length of said helical coil spring,
said cylindrical member being axially rigid, allowing a portion of the coils of said helical coil spring to frictionally slide against said cylindrical sleeve member as said helical coil spring undergoes lineal dimensional variation during compression and expansion, and imparting a radially directed force resilient to radial dimensional variation of the helical coil spring as it undergoes compression and expansion, thereby damping the motion of said helical coil spring,
said cylindrical sleeve member having a first end with a continuous annular radially extending flange portion integrally formed therewith,
said flange portion being interposed between said helical coil spring and one of said spring and unsprung members,
and said cylindrical member having a second end which is open.

4,538,564

IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

Karl Ehrmann, and Richard Gerber, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

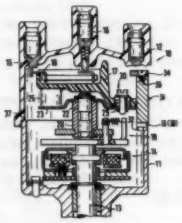
PCT No. PCT/DE82/00220, § 371 Date Jun. 23, 1983, § 102(e) Date Jun. 23, 1983, PCT Pub. No. WO83/01981, PCT Pub. Date Jun. 9, 1983

PCT Filed Nov. 20, 1982, Ser. No. 515,055

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1981, 3148053

Int. Cl.³ F02P *1/00*

U.S. Cl. 123—146.5 A 6 Claims



1. An ignition device, for internal combustion engines having

an electronic system for the adjustment of both the ignition instant and the triggering of the ignition instant, and having a high-voltage distributor (10) rotating in synchrony with the internal combustion engine by means of a drive shaft (13), the high-voltage distributor (10) having a distributor rotor (17) with a rotor electrode (18) which supplies the ignition voltage via a respective fixed electrode (15) to at least one spark plug, and a cup-shaped housing (11) secured on the engine block, having a rim (37), and receiving the drive shaft,

characterized by

a centrifugal adjustor (19), the distributor rotor (17) and the drive shaft (13) being coupled via the centrifugal adjuster, which effects a follow-up adjustment of the distributor rotor with respect to the drive shaft (13), independently of the ignition triggering;

an adjusting ring (31) determining the relative angular position of said rotor (17) and said centrifugal adjuster (19), said ring being mountable on the rim (37) of the housing (11) in only one defined position (38) and having a protrusion (34) pointing into the interior of the housing (11), which protrusion serves as a stop for the adjustment of the rotor electrode (18);

and

means (20, 23, 27, 28, 29, 30) for clamping the rotor (17) to the centrifugal adjustor (19) in an infinitely variable manner within an angular range.

4,538,565

LUBRICANT PASSAGE SYSTEM FOR INTERNAL COMBUSTION ENGINES

Yoshiaki Hidaka, and Hiroshi Shinagawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

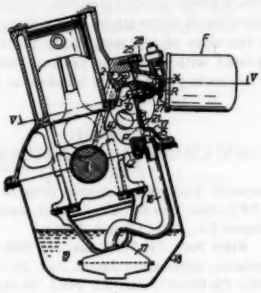
Filed Nov. 18, 1983, Ser. No. 553,860

Claims priority, application Japan, Nov. 24, 1982, 57-205822

Int. Cl.³ F01M *1/00*

U.S. Cl. 123—196 R 1 Claim

1. In an internal combustion engine having a crankshaft, a side wall parallel to the crankshaft, and having an end wall normal to the crankshaft, the improvement comprising, in combination: a lubricating oil pump on the outer face of said end wall and adjacent said side wall, an oil filter on the outer face of and located substantially midway of the length of said side wall, a substantially straight sub-gallery in said side wall establishing communication between said oil pump and said oil filter, a substantially straight main gallery in said side wall and substantially parallel to the crankshaft for the full length of said



side wall, said main gallery connected to said oil filter to receive lubricating oil from said oil filter, and a plurality of branched oil supply passages connecting said main gallery to parts of the engine to be lubricated.

4,538,566

COMBUSTION CHAMBER IN A DIESEL ENGINE

Shingo Tsuruoka, Hino, Japan, assignor to Hino Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP83/00128, § 371 Date Sep. 28, 1983, § 102(e) Date Sep. 28, 1983, PCT Pub. No. WO83/03875, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 23, 1983, Ser. No. 545,039

Claims priority, application Japan, Apr. 23, 1982, 57-68435; Apr. 23, 1982, 57-68436; Apr. 30, 1982, 57-73772

Int. Cl.³ F02B *19/08*

U.S. Cl. 123—276 19 Claims

1. A combustion chamber in a diesel engine, characterized in that the combustion chamber is defined in a top surface of a piston, an inlet in said top surface for communication with an upper end of the combustion chamber, a flow restriction at said inlet, a plurality of recesses in a surrounding side surface of the combustion chamber, and fuel nozzle means for injecting atomized streams of fuel toward different wall portions of the combustion chamber such as deep portions of the recesses, shallow portions of the recesses, and portions free of the recesses, said fuel nozzle means including a number of injection ports which is different from the number of said recesses for causing the atomized streams of fuel to be injected toward said different wall portions.

4,538,567

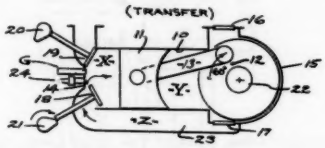
INTERNAL COMBUSTION HEAT ENGINE

Harlow B. Grow, 16530 Chattanooga Pl., Pacific Palisades, Calif. 90272

Division of Ser. No. 477,533, Mar. 21, 1983,. This application Aug. 13, 1984, Ser. No. 640,133

Int. Cl.³ F02B *33/04*

U.S. Cl. 123—305 **7 Claims**



1. A two stroke internal combustion heat engine having a combustion chamber, a compression chamber, and a separate transfer chamber for storage of compressed combustion support air, and including:

a cylinder with a head closing a top end thereof and the combustion chamber, and with a case closing a bottom end thereof and the compression chamber,

a piston reciprocable in the cylinder and coupled to a crank by a connecting rod and together operable between a Top Dead Center position and a Bottom Dead Center position,

intake valve means opening into the compression chamber continuously during a stroke of the piston from Bottom Dead Center position to Top Dead Center position to fill the same with combustion support air,

storage valve means opening from the compression chamber and into the separate transfer chamber during at least a portion of a first power stroke of the piston toward Bottom Dead Center position to charge said separate transfer chamber with compressed combustion support air and storing said charge within said transfer chamber,

transfer valve means opening from the separate transfer chamber and into the combustion chamber during the initial portion of the first power stroke of the piston from Top Dead Center position to fill the increasing volume of the combustion chamber with compressed combustion support air,

fuel injection means admixing fuel into the compressed combustion support air in the combustion chamber,

ignition means discharging a spark in the combustion chamber following the said initial portion of and to effect the first power stroke continuing to Bottom Dead Center position,

and an exhaust valve means in the head of the cylinder and opening from the combustion chamber during a second reciprocal exhaust stroke from Bottom Dead Center position to Top Dead Center position.

4,538,568

TWO-STROKE CYCLE MULTISPARK IGNITION TYPE GASOLINE ENGINE

Tetsuzo Fujikawa, Kobe, and Shinji Abe, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 330,841, Dec. 15, 1981, abandoned. This application Apr. 16, 1984, Ser. No. 599,604

Claims priority, application Japan, Dec. 22, 1980, 55-182398

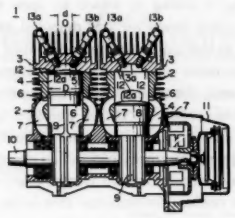
Int. Cl.³ F02P *15/02*

U.S. Cl. 123—310 **3 Claims**

1. A two stroke cycle spark ignition type internal combustion engine comprising:

at least two ignition plugs for each cylinder substantially equidistantly spaced from the center of the cylinder and spaced from each other a distance which is in the range between about 0.35 to about 0.45 (in terms of d/D, where d is the distance between plugs and D is the inner diameter of the cylinder);

projections formed on the inner wall surface of the cylinder head defining a combustion chamber, said projections having undersides facing the upper surface of a piston in the cylinder to provide an annular squish area at the cylinder periphery in the range of about 0.5 to about 0.8 (in terms of d'/D, where d' is the inner diameter of the annular squish area) for producing a squishy current; and



an ignition device connected to said ignition plugs for simultaneously actuating the two ignition plugs, sad ignition device including a delay circuit for reducing the advance angle of the ignition timing in the high-speed rotation range as compared with the ignition timing in the most advanced rotation range.

4,538,569

COMPRESSION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE AND CONTROL METHOD THEREFOR

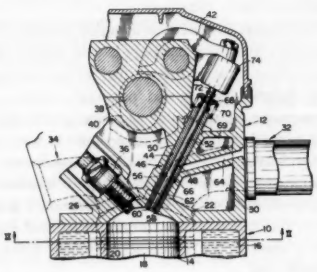
Shigemi Sugino, Fujisawa; Kenichi Sasaki, Yokohama, and Yoshio Iwasa, Nagareyama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 10, 1983, Ser. No. 465,495

Claims priority, application Japan, Mar. 1, 1982, 57-32071

Int. Cl.³ F01L *13/08*

U.S. Cl. 123—316 **21 Claims**



6. In an internal combustion engine having an engine cylinder block defining therein a plurality of engine cylinders and a cylinder head mounted on said cylinder block and defining therein an intake port and an exhaust port for introducing an air/fuel mixture into a combustion chamber defined in each engine cylinder, and exhausting an exhaust gas created in said combustion chamber,

a method for controlling the compression ratio in said combustion chamber comprising the steps of:

defining a feedback circuit for feeding some of the air/fuel mixture in said combustion chamber back to an induction system of the engine;

providing a compression control valve in said feedback circuit;

detecting an engine operating parameter;

comparing the detected engine operating parameter with a predetermined threshold value to determine an open period of said compression control valve depending on said engine operating parameter;

detecting engine operational position in terms of the engine stroke cycle; and

determining a timing at which to open said compression control valve based on said detected engine operational position so that said compression control valve is operated in synchronism with the engine revolution, said opening period being determined in such a manner that:

said valve is open for a first duration when said engine speed and said engine load are respectively higher than an engine speed threshold and an engine load threshold, and said engine coolant temperature is lower than an engine coolant temperature threshold;

said valve is open for a second duration when said engine speed, said engine load and said engine coolant temperature are respectively higher than said engine speed threshold, said engine load threshold and said engine coolant temperature threshold;

said valve is open for a third duration when said engine speed and said engine load are not both respectively higher than said engine speed threshold and said engine load threshold and said engine coolant temperature is higher than said engine coolant temperature threshold;

said valve is open for a fourth duration when said engine speed and said engine load are both respectively higher than said engine speed threshold and said engine load threshold and said engine temperature is lower than said engine temperature threshold; and

said valve is open for a fifth duration when said starter switch is ON.

15. A compression control system for an internal combustion engine comprising:

an engine cylinder defining a combustion chamber therein;

an induction system for introducing an air/fuel mixture into said combustion chamber;

a return passage defined in said engine cylinder and connecting said combustion chamber to said induction system for conducting some of the air/fuel mixture in said combustion chamber back to said induction system;

a compression control valve provided in said return passage and movable between a first position in which communication between said combustion chamber and said induction passage via said return passage is blocked and a second position in which said communication is established;

a sensor for detecting at least one preselected engine operation parameter for producing a sensor signal indicative thereof; and

a controller for controlling the operation of said compression control valve depending on an engine operating condition as represented by said sensor signal, said controller producing a control signal to actuate said compression control valve from said first position to said second position for a duration corresponding to the duration of said control signal, and said controller being operable to compare said sensor signal value with a predetermined threshold value to derive a first shorter duration of said control signal when said sensor signal value is equal to or less than said threshold value and a second longer duration of said control signal when said sensor signal value is greater than said threshold value.

4,538,570

FLUID VALVE

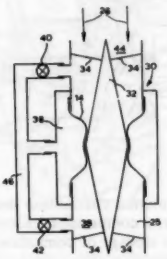
Martin R. Lunt, Brentwood, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 29, 1984, Ser. No. 594,520

Claims priority, application United Kingdom, May 31, 1983, 8314988

Int. Cl.³ F02M *9/10*

U.S. Cl. 123—337 **10 Claims**



1. A throttle valve assembly for controlling the flow of an air/fuel mixture through a carburetor of a motor vehicle, the assembly including an air/fuel flow path having a core positioned centrally therein, the flow path being defined by a tube valve having a flexible wall separating the flow path from a working fluid chamber surrounding the flexible wall, whereby changes in the pressure within the chamber cause deformation of the flexible wall resulting in changes in the tube cross-section between a wide open throttle valve position and a valve closed position, characterized in that the flexible wall collapses to a valve closed position in a free state when the pressures on opposite sides of the wall are equal, and means in the valve closed position providing a minimum fluid flow through the flow path from one side of the valve to the other side, the flexible wall sealing against the core in the valve closed position, an external bypass passage connected to the flow path from one side of the valve to the other through which passes the minimum fluid flow volume, and means interconnecting the external passage and working fluid chamber so that the chamber can be connected to the fluid pressure on either side of the tube valve, and a control valve for controlling flow through the bypass passage.

4,538,571

REGULATING ARRANGEMENT FOR FUEL ADJUSTING MEANS FOR A SELF-IGNITING INTERNAL COMBUSTION ENGINE

Rainer Buck, Tamm; Gerhard Engel, Stuttgart; Thomas Küttner, Stuttgart; Wilfried Sautter, Stuttgart, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,984

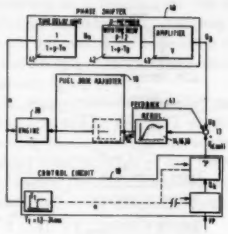
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1982, 3232725

Int. Cl.³ F02D *1/04, 11/10*

U.S. Cl. 123—357 **12 Claims**

1. A regulating device for an adjuster of a self-igniting internal combustion engine including sensors for producing at least one signal corresponding to actual rotary speed of the engine, comprising control means for generating at least one signal corresponding to a desired rotary speed of the engine, means for comparing the desired and actual rotary speed signals, and an electronic regulating circuit connected between the com-

paring means and a fuel dose adjuster, said regulating circuit including a phase rotating member and a feedback path for the



actual rotary speed signal, said feedback path being coupled to said regulating circuit after said phase rotating member.

4,538,572

ELECTRONICALLY CONTROLLED IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

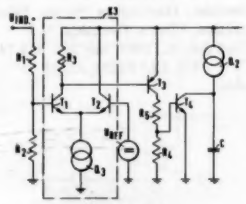
Rainer Rodenheber, Heilbronn-Biberach, Fed. Rep. of Germany, assignor to TELEFUNKEN electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 530,694

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233554

Int. Cl.³ F02B *5/04*

U.S. Cl. 123—418 **4 Claims**



1. Electronically controlled ignition system for an internal combustion engine for compensation of the advance of the ignition point compared with the mechanical position of the rotor at low speeds, wherein a correction signal (F) is derived from a square wave control signal (A) derived directly from the induction sensor by a sawtooth-shaped signal (B) being generated within each period of the control signal from a flank (X) of this signal and by the correction signal (F) being lengthened with respect to the control signal by a part (Δt) of the time determined by the falling flank of the sawtooth-shaped signal, said part (Δt) changing with the speed (n) of the rotor, said sawtooth-shaped signal being given by the voltage course at a capacitor (C) which is charged up to the occurrence of the control flank (X) of the control signal, after which it is discharged up to the point where it reaches a predetermined reference voltage (U_F), characterized in that the speed-dependent output voltage (U_{ind}) of the induction sensor is compared with a reference voltage (U_{REF}) at a comparator (K_3), with the reference voltage (U_{REF}) being chosen such that it is exceeded by the output voltage of the induction sensor from a certain speed of the rotor on, with an output pulse (T_H) being released at the comparator, and in that the capacitor (C) is discharged with this output pulse (T_H) such that correction of the control signal (A) does not take place, and wherein the comparator (K_3) is compared of two transistors (T_1, T_2) connected at the emitter electrodes, as in a differential amplifier, with the input signals being fed to the base electrodes of the transistors, and the output signal tapped at a collector resistor (R_3) of a transistor (T_1) is fed to a transistor (T_4) connected in parallel with the capacitor (C), which transistor (T_4) is made conductive at the occurrence of an output pulse (T_H) at the comparator and serves as a discharge path for the capacitor (C).

4,538,573

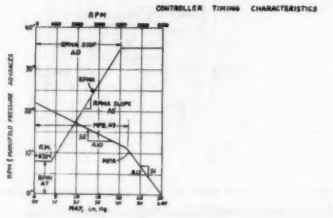
ELECTRONIC ENGINE CONTROL

James W. Merrick, El Paso, Tex., assignor to General Dynamics Corporation, St. Louis, Mo.

Division of Ser. No. 229,924, Jan. 30, 1981, Pat. No. 4,408,582, which is a division of Ser. No. 899,355, Apr. 24, 1978, Pat. No. 4,284,053. This application Apr. 13, 1983, Ser. No. 484,427

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—418 **7 Claims**

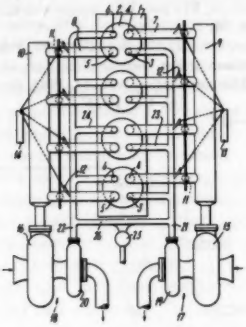


1. In an electronic controller for an internal combustion engine having an ignition system responsive to ignition pulses for producing ignition sparks in combustion chambers, said controller including means for generating a reference timing signal indicative of movement of the engine to a reference position in the engine cycle, timing advance control means for producing a timing advance control signal corresponding to a respective angular displacement of said engine from said reference position, and means responsive to said reference timing signal and said timing advance control signal for producing ignition pulses at positions relative to said reference timing position systematically related to said timing advance control signal, the improvement wherein said timing advance control means comprises RPM advance means responsive to engine speed for producing an RPM timing advance signal systematically related to engine speed and corresponding to a respective timing advance systematically increasing with increase in engine speed, manifold pressure advance means responsive to manifold pressure for producing a manifold pressure timing advance signal systematically related to manifold pressure and corresponding to a respective timing advance systematically decreasing with increase in manifold pressure, output means responsive to applied timing advance signals for producing a timing advance control signal corresponding to the sum of the respective timing advances, means for applying said RPM timing advance signal and said manifold pressure timing advance signal to said output means, means for providing an engine idle reference signal corresponding to engine operation at idle, means for providing a low idle timing limit signal corresponding to a respective timing advance suitable for operation of the engine at idle, means responsive to engine operation and said engine idle reference signal for modifying said low idle timing limit signal in systematic relation to engine operation when said engine operates above idle to produce an idle timing limit signal corresponding to a respective timing advance systematically increasing with increase in engine operation above idle, and means responsive to said idle timing limit signal for limiting the timing advance control signal to a maximum total timing advance corresponding to said idle timing limit signal.

4,538,574
SUPERCHARGED INTERNAL COMBUSTION ENGINE WITH A CYLINDER HEAD HAVING FOUR VALVES PER CYLINDER

Claudio Lombardi, Turin, Italy, assignor to Fiat Auto S.p.A., Italy

Filed Mar. 20, 1984, Ser. No. 591,604
Claims priority, application Italy, Mar. 25, 1983, 67331 A/83
Int. Cl.³ F02B *13/00*
U.S. Cl. 123—432 **8 Claims**



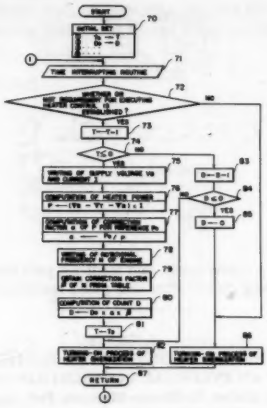
1. An internal combustion engine comprising:
(a) at least two in-line cylinders forming combustion chambers,
(b) at least two turbo-compressor units for supercharging said cylinders and with said units being placed at the sides of the engine,
(c) a cylinder head having four valves per cylinder with each set of said valves being arranged progressively around the circumference of the respective combustion chamber with alternating induction and exhaust valves,
(d) each said turbo-compressor unit being connected to induction and exhaust manifolds which are in turn respectively associated with induction and exhaust valves which are disposed on one side of a longitudinal axis passing through said cylinder head of said engine.

4,538,575
DEVICE FOR CONTROLLABLY HEATING OXYGEN SENSOR

Yoshiki Chujo, Susono, and Hiroshi Noguchi, Gotenba, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 6, 1983, Ser. No. 511,235
Claims priority, application Japan, Apr. 13, 1983, 58-63752
Int. Cl.³ F02B *3/00, 33/00*
U.S. Cl. 123—440 **22 Claims**

1. A device for controllably heating an oxygen sensor provided in an exhaust pipe of an internal combustion engine comprising;
a means for supplying heat to said oxygen sensor;
means for generating from said oxygen sensor an output proportional to the oxygen concentration in the exhaust gas from said internal combustion engine and the air/fuel ratio which is controlled in the lean mixture regions by means of an oxygen sensor;
means for providing pulse current to the heater wherein said heater is controlled in relation to the heater voltage and the heater current and wherein the current in the form of a pulse has a specific cycle which is supplied to said heater and the ratio of the pulse width to the cycle is controlled on the basis of the product of the signal related to the heater voltage and the signal related to the heater current,

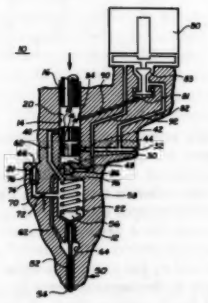


such that the power consumption of the heater per unit time is maintained within a predetermined range.

4,538,576
DIESEL FUEL INJECTOR WITH DOUBLE DUMP CONFIGURATION

Michael J. Schneider, Huntington Woods, Mich., assignor to Allied Corporation, Morris Township, N.J.

Filed Jul. 21, 1983, Ser. No. 515,747
Int. Cl.³ F02M *47/02*
U.S. Cl. 123—446 **9 Claims**



1. A fuel injector for an internal combustion engine comprising:
a body having an axially extending bore;
a primary pumping plunger and a secondary plunger positioned within said body for at least partial axial movement therein;
a nozzle situated at an end of said bore remote from said second plunger;
a timing chamber defined in said body between said primary pumping plunger and said secondary plunger;
a metering chamber defined in said body between said secondary plunger and said nozzle;
first passages in said injector for receiving pressurized fuel and transmitting said fuel into said timing chamber and said metering chamber; and
an electromagnetic control element for controlling the timing of the discharge of fuel from the metering chamber

through the nozzle and the quantity of fuel stored in said metering chamber subsequent to said discharge of fuel;

fuel dump means for dumping the fuel in the timing and metering chambers as a function of the motion of the secondary plunger including fuel dumping ports located on said bore and uncovered by the motion of said secondary plunger including a timing chamber dump port and a metering chamber dump port;

a spring cage, in communication with said timing chamber dump port and adapted to receive a portion of a needle valve, containing biasing means for urging said needle valve to prohibit the discharge of fuel therefrom;

second passages means for communicating said spring cage to a drain including, in series, an orifice and a check valve; and

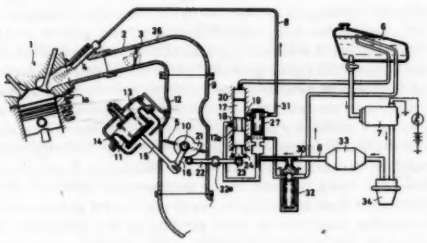
third passage means for communicating said metering chamber dump port to said drain.

4,538,577

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINE

Toshio Nomura, Niiza; Eiji Taguchi, Tokyo, and Tomio Aoi, Omiya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1980, Ser. No. 131,133
Claims priority, application Japan, Mar. 22, 1979, 54-32220
Int. Cl.³ F02M *39/00*
U.S. Cl. 123—452 **2 Claims**



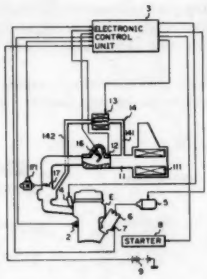
1. A fuel injection apparatus for an internal combustion engine for a motorized two-wheeled vehicle, comprising: an intake passage for an internal combustion, a throttle valve on a downstream side, a fuel injection nozzle connected through a fuel passage to a fuel pump, an air metering valve on an upstream side of the throttle valve and arranged so that, by a negative pressure responsive member arranged to be operated in response to an intake negative pressure at an intermediate portion between the member and the throttle valve, the same may be turned towards its opening side according to increase in the intake negative pressure, said fuel passage having a fuel metering valve which is so arranged that, when the air metering valve is turned towards its opening side, the same may be operated towards its opening side through a lever operating in conjunction with a cam mounted on a rotary shaft of the air metering valve, said fuel metering valve being formed into a slidable type spool valve, a valve body thereof being disposed in parallel with a valve body of the air metering valve, said lever being in engagement, at its one end, with said cam and being swingably supported at its middle portion and being brought in engagement at its other end with a valve rod projecting from one end portion of said fuel metering valve, said apparatus being located below the fuel tank and above the crank case of the engine.

4,538,578

AIR-FUEL RATIO CONTROL FOR AN INTERNAL COMBUSTION ENGINE

Atsushi Suzuki; Masakazu Ninomiya, both of Kariya, and Katuya Maeda, Obu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 19, 1984, Ser. No. 572,147
Claims priority, application Japan, Jan. 20, 1983, 58-8104
Int. Cl.³ F02D *9/02, 1/04;* **F02M** *25/06*
U.S. Cl. 123—478 **12 Claims**



1. A method for controlling the air-fuel ratio in an internal combustion engine, said method comprising the steps of:

dithering the air-fuel ratio about a basic air-fuel ratio to a predetermined extent by using an air path bypassing an air flow sensor in an intake pipe of said engine, said bypass path including a bypass air control valve which may assume one of an ON mode allowing air to pass through said bypass path and an OFF mode prohibitting air to pass through said bypass path;

running the engine on the basis of said dithered air-fuel ratio;

monitoring operating conditions of said engine;

detecting the changes of said operating conditions of said engine;

correcting the basic air-fuel ratio in a desirable direction corresponding to the direction of change of the air-fuel ratio during said dithering which improved the specific fuel consumption as determined by the monitored operating conditions;

determining a fundamental fuel injection pulse τ based on said corrected basic air-fuel ratio;

correcting said fundamental fuel injection pulse τ by the application of a fuel correction coefficient (K_1) which is derived by using maps which indicate the relationship between said fuel correction coefficient (K_1) and one of (a) a number of fuel injections since said air control valve transitioned between said ON and OFF modes, (b) a number of engine rotations since said air control valve transitioned between said ON and OFF modes, and (c) a period of fuel injection since said air control valve transitioned between said ON and OFF modes; and

said running step including the step of injecting fuel in accordance with said corrected fundamental fuel injection pulse.

4,538,579

FUEL SUPPLY CONTROL SYSTEM

Kouichi Moriya, and Kouki Iwata, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1984, Ser. No. 585,586
Claims priority, application Japan, Mar. 4, 1983, 58-034402
Int. Cl.³ F02B *3/00;* **F02D** *35/00*
U.S. Cl. 123—492 **1 Claim**

1. A fuel supply control system for controlling an amount of fuel supplied to an internal combustion engine by driving a step

motor operatively coupled to fuel supply control means of the engine and having an excitation circuit, comprising:

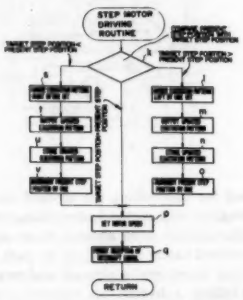
(a) an accelerator-pedal position detector means for generating an output correspondiing to a position to which an accelerator pedal is depressed;

(b) a voltage detector means for generating an output corresponding to a power supply voltage supplied to said excitation circuit;

(c) a step motor speed setting means for generating an output at a period dependent on a rotational speed of the step motor which corresponds to said output from the voltage detector means;

(d) a target step position memory means for storing a target step position of the step motor corresponding to said output from said accelerator-pedal position detector means;

(e) a present step position memory means for storing a present step position of the step motor;



(f) a comparator means for comparing the stored content of said target step position memory means with the stored content of said present step position memory means each time an output is provided by said step motor speed setting means; and

(f) a driver means responsive to an output from said comparator means for selectively outputting excitation pulses to said excitation circuit so as to turn said step motor by one step in one direction and for incrementing the stored content of said present step position memory means by one and for outputting excitation pulses to said excitation circuit so as to turn said step motor by one step in an opposite direction and for decrementing the stored content of said present step position memory means by one, said step motor direction and changing of the stored content of said present step position memory being dependent upon an output from said comparator means, said driver means outputting excitation pulses until the stored content of said present step position memory means is equal to the stored content of said target step position memory means.

4,538,580

FUEL INJECTION PUMP

Max Straubel, Stuttgart; Hermann Eisele, Vaihingen, both of Fed. Rep. of Germany; Jean Leblanc, Lyons, and Jean Pigeroulet, Villeurbanne, both of France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

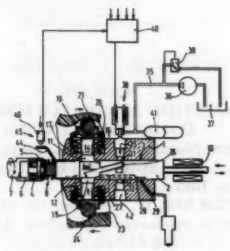
Filed Oct. 19, 1983, Ser. No. 543,660

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243348

Int. Cl.³ F02M *59/34*

U.S. Cl. 123—494 **15 Claims**

1. A fuel injection pump having at least one work chamber defined by a pump piston, which chamber communicates continuously with a distributor opening on a distributor rotating in a bore and coupled with a drive shaft and by means of this distributor opening the work chamber can upon the rotation of the distributor, be made to communicate in sequence during a supply stroke of the pump piston with supply lines disposed about the circumference of the bore and which leads to the fuel injection location, and the pump work chamber furthermore communicates continuously with a control groove in a jacket face of the distributor, said control groove being disposed obliquely with respect to the axis of said distributor cooperating with at least one opening discharging into the bore of a fuel conduit and communicates with a fuel supply source, and the distributor is axially displaceable with respect to said drive shaft while maintaining its rotational angle position and thus the rotational position of the control groove is variable with respect to the opening of the fuel conduit and of the drive shaft wherein the fuel conduit can be made to communicate via an electrically actuatable switching valve with the fuel supply source, and the switching valve is controllable during the intake stroke of the pump piston by an electrical control device



in such a manner that the switching valve is at the latest opened after the opening, in its function as the metering opening of the fuel conduit, has been opened by the control groove and the switching valve is closed at a time that the control groove has still opened the opening of the fuel conduit, and that furthermore a transducer is associated with the distributor, said transducer has a movable part connected with the distributor and also has a stationary part, the stationary part being a receiver and the movable part having a control edge for triggering a pulse on the part of the receiver, an inclination B_1 of the control edge being opposite in the displacement direction of the distributor from an inclination α_1 of the control groove, which transducer ascertains an axial position of the distributor as a signal for the rotational position of the control groove with respect to the opening of the fuel conduit, which signal serves as signal for the onset of the metering of the fuel to be injected which is controlled by a control device via the switching valve.

4,538,581

DEVICE FOR MEASURING THE LOAD ON A TURBO-CHARGED DIESEL ENGINE, ESPECIALLY FOR REGULATING THE INJECTION TIMING IN DEPENDENCE THEREON

Nils O. Håkansson, Stenkullen, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Dec. 8, 1981, Ser. No. 328,644

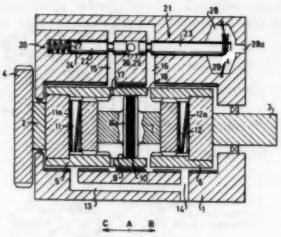
Claims priority, application Sweden, Dec. 16, 1980, 8008834

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—502 **3 Claims**

1. Device for regulating the fuel injection timing of a turbocharged diesel engine, comprising an centrifugal device driven by the engine and producing a hydraulic force proportional to the square of the rotational speed of the engine, a pair of first and second hydraulic slide valves, spring means acting continuously on said first valve, means for continuously applying charging pressure of a said engine to said second valve, means for continuously applying said hydraulic force to said first and second slide valves in directions opposite to the directions in

which said spring means and said charging pressure respectively act, an injection adjustor having an input shaft adapted to be driven by a power take-off of a said engine and an output shaft adapted to be connected to an injection pump of a said engine and power transmitting means between said shafts adapted to vary the relative angular position of the shafts, and hydraulic circuit means for actuating said power transmitting



means, said circuit having a first conduit controlled by said first valve and a second conduit controlled by said second valve, said first valve acting on said first conduit when said hydraulic force predominates over said spring means to actuate said power transmitting means to advance said timing, said second valve acting on said second conduit when said charging pressure predominates over said hydraulic force to actuate said power transmitting means to retard said timing.

4,538,582

METHOD OF COMBUSTING FUEL IN AN INTERNAL COMBUSTION ENGINE AND ITS APPARATUS

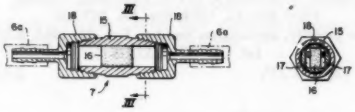
Koichi Wakuta, Hamamatsu, Japan, assignor to Johoku Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 31, 1984, Ser. No. 575,936

Claims priority, application Japan, Feb. 4, 1983, 58-16131

Int. Cl.³ F02B *75/10*

U.S. Cl. 123—538 **14 Claims**



1. In an internal combustion engine having a cylinder section, a fuel supply, means for injecting fuel from said fuel supply into said cylinder section for combustion therein, and means for directing fuel along a path from said fuel supply to said injecting means, the improvement comprising means for applying a strong magnetic field to the fuel at a location in one of a segment of said path and said fuel injecting means, said magnetic field applying means including a tubular ferromagnetic yoke and a first plate-shaped permanent magnet disposed in said yoke so as to define fuel flow passages on respective opposite sides of said first magnet between the opposite side faces of said first magnet and the inner walls of said yoke, said first magnet having its north and south poles at said respective side faces, so that the fuel flows through said fuel flow passages to be subjected to a strong magnetic field therealong the fuel flow through one of said fuel flow passages being subjected only to a northern magnetic field and the other fuel flow through the other fuel flow passage being subjected only to a southern magnetic field.

4,538,583

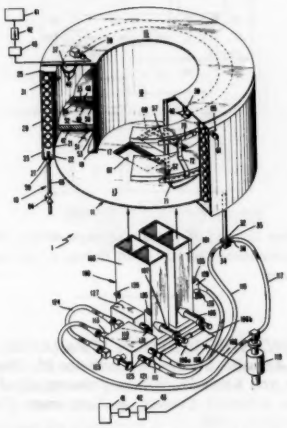
FUEL EVAPORATION APPARATUS AND METHOD

Gregory Earl, 4005 Saul Rd., Kensington, Md. 20895

Filed Aug. 10, 1984, Ser. No. 639,315

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **11 Claims**



1. An evaporator apparatus for use in the fuel supply system of an internal combustion engine, comprising:

(a) housing means including an opening closed by removable cover means;

(b) inlet means for admission of fuel to chamber means said inlet means comprising pore means provided at spaced locations about said chamber means;

(c) thermal disc means mounted in said chamber means, said thermal disc means being controllably heated whereby fuel from said inlet means impinging upon said thermal disc means is vaporized;

(d) outlet means for evacuating vaporized fuel from said chamber means; and

(e) said cover means defining a trough having an inlet port connectable to a supply of fuel, said pore means communicating said trough with said chamber means.

4,538,584

DIESEL INTERNAL COMBUSTION ENGINE

Karl Schier, Friedrichshafen, and Gerd-Michael Wolters, Markdorf, both of Fed. Rep. of Germany, assignors to MTU- Motoren- und Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Apr. 10, 1984, Ser. No. 598,796

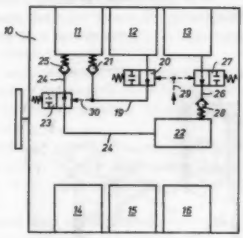
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323337

Int. Cl.³ F02B *33/02*

U.S. Cl. 123—559 **4 Claims**

1. A diesel internal combustion engine having a relatively low compression ratio and supercharged by exhaust gas turbocharger means, comprising several cylinder means, at least one cylinder means being operated as engine cylinder means during starting and at partial loads while another cylinder means is operated as compressor means charging the engine cylinder, the piston of the compressor cylinder means leading the piston of the engine cylinder means so far that the engine cylinder means is charged by the compressor cylinder means directly by way of a first connecting line, an air storage means coordinated to and operatively connected with the engine cylinder means by way of a second line including a valve means for closing said line, said air storage means being operable to be charged during starting and at partial loads by a further cylinder means of the internal combustion engine operatively connected with

the air storage means, and said valve means being controlled by the pressure of the compressed air of the compressor cylinder means directly charging the engine cylinder means in such



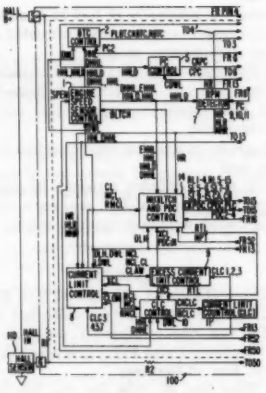
a manner that the air of the air storage means charges the engine cylinder means jointly with the air of the compressor cylinder means.

4,538,585

DYNAMIC IGNITION APPARATUS

Leonard E. Arguello, Sunnyvale, Lawrence M. Blaser, Mountain View, and Verne H. Wilson, Belmont; all of Calif., assignors to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Aug. 2, 1982, Ser. No. 404,068
Int. Cl.³ F02P *3/04*
U.S. Cl. 123—609 **33 Claims**



1. An engine ignition apparatus for an engine having an ignition coil and period which extends from the termination of a dwell to the termination of the next dwell comprising:

means responsive to engine speed for providing a predetermined burn-time period, said predetermined burn-time period of time comprising a fixed period of time if the average engine speed during the preceding period was equal to or less than a predetermined RPM and a time equal to a predetermined percentage of the length of the preceding period if the highest engine speed during said preceding period was greater than said predetermined RPM;

means for providing a pre-dwell signal at the end of a pre-dwell period in said period at a time determined by the length of the dwell in the preceding period; and

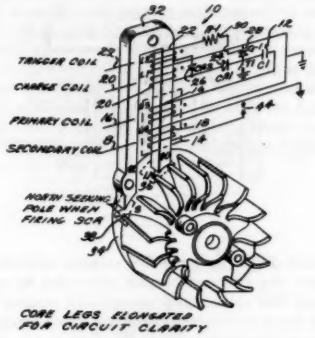
means responsive to the termination of said burn-time period and said pre-dwell signal for starting a dwell in said period.

4,538,586

CAPACITIVE DISCHARGE IGNITION WITH LONG SPARK DURATION

Thomas P. Miller, Charlotte, N.C., assignor to Textron, Inc., Providence, R.I.

Filed Dec. 21, 1983, Ser. No. 563,864
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—620 **10 Claims**



1. In an ignition system for an internal combustion engine of the type including means for generating a varying magnetic flux in accordance with the operation of said engine; a step-up transformer having primary and secondary coils, said secondary coil being adapted for coupling to a spark ignition device; and means for selectively generating at least one current pulse through said transformer primary coil in timed relation to operation of said engine to induce an ignition voltage to said spark ignition device; the improvement wherein:

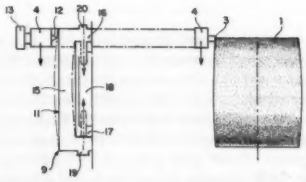
said transformer comprises means responsive to said varying magnetic flux for inducing a sustaining voltage in said transformer secondary coil for application to said spark device in timed relation with said ignition voltage.

4,538,587

DRESSING DEVICE

Bengt Nilsson, Ängsvägen 9, 531 55 Lidköping, Sweden

Filed Jan. 11, 1984, Ser. No. 569,834
Claims priority, application Sweden, Feb. 14, 1983, 8300784
Int. Cl.³ B24B *53/08*
U.S. Cl. 125—11 TP **2 Claims**



1. Apparatus for dressing a regulating wheel (1) having a rotational axis in a centerless grinding machine, comprising:

a dressing point (3) mounted on a movable support (4) such that movement of the support results in movement of the dressing point along a path on said regulating wheel, wherein said rotational axis is inclined with respect to said path;

a forming bar (9) of U-shaped cross section having an elongated normally flat surface (11) having predetermined flexibility and disposed generally parallel to the path of the dressing point;

a follower (12) mounted on said movable support (4) engageable with said surface whereby movement of said follower along said surface effects movement of said dressing point (3) against said regulating wheel; and

tensioning means positioned between the legs of said U-shaped forming bar and operable to draw said legs toward one another and thereby effect flexure of said elongated forming bar surface and outward bowing thereof to a predetermined curvature whereby the curvature formed on the regulating wheel by the dressing point may be selectively varied solely by adjustment of said leg tensioning means.

4,538,588

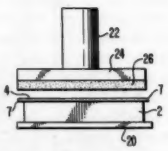
METHOD FOR FORMING GLAZED TILE

Stephen H. Nyman, 5301 Westbard Cir., Bethesda, Md. 20016

Filed Dec. 8, 1983, Ser. No. 559,194

Int. Cl.³ B28D *1/32*; C03B *33/02*

U.S. Cl. 125—23 R **1 Claim**



1. The method of removing from a piece of glazed tile having side walls and a glazed surface the edges of which protrude beyond the side walls of the tile, which consists in supporting the tile, supporting a compressible sheet of material upon rigid backing surface, said backing surface and sheet material extending in all directions beyond the edges of said prortruding glaze, and forcing said supported sheet of compressible material against the glaze and tile with sufficient pressure to break said glaze at each sidewall of said tile.

4,538,589

TOTALLY ADJUSTABLE CAMPFIRE COOKING GRILL

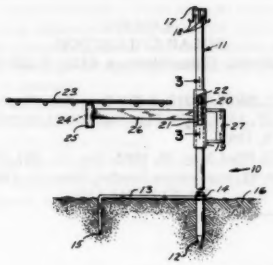
Dennis W. Preston, 10509 Xavis St., N.W., Coon Rapids, Minn. 55433

Filed Jul. 18, 1984, Ser. No. 632,055

Int. Cl.³ A47J *37/07*

U.S. Cl. 126—30 **1 Claim**

1. A totally adjustable campfire cooking grill, comprising, in combination, a vertical, metal post, a removable cap freely fitted upon a top end of said post, a plurality of spaced apart, utensil-hanging hooks around a side of said cap, a metal grill unit rotatably and slideably supported along said post, said unit comprising a first sleeve around said post, a horizontal bar welded at one end to said sleeve, a second vertical sleeve welded to an opposite end of said bar, a horizontal grill having a downward pin under a center thereof, rotatably received in said second sleeve, an "L"-shaped bolt having a threaded end screwed in a side of said first sleeve for abutting and locking against said post, and a "U"-shaped handle affixed along a side



of said first sleeve; and means for supporting said post upright comprising a collar welded around a lower end of said post and a pair of elongated, triangular plates welded at one end to said collar, said plates extending radially from said collar in a horizontal direction for placement of ballasting rocks thereupon.

4,538,590

COOKWARE HAVING INTEGRALLY FORMED NATURAL STONE BOTTOMS AND METHOD OF MANUFACTURING THE SAME

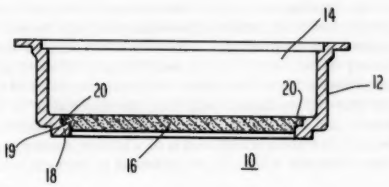
Chang H. Oh, Seoul, Rep. of Korea, assignor to J & L Importers, Inc., King of Prussia, Pa.

Filed Oct. 31, 1984, Ser. No. 666,820

Claims priority, application Rep. of Korea, May 22, 1984, 4702

Int. Cl.³ A47J *27/00*

U.S. Cl. 126—390 **5 Claims**



1. A method of forming a cooking utensil comprising the steps of:

(a) providing a substantially flat bottom portion of natural stone;

(b) machining said natural stone bottom portion to form an outwardly extending peripheral lip about the perimeter thereof;

(c) heating said bottom portion to a temperature of from about 200° C. to about 300° C. for stress relief;

(d) thereafter heating said stress relieved bottom portion to a temperature of about 200° C. for a period exceeding four minutes;

(e) placing said bottom portion in a mold; and

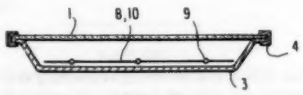
(f) casting an aluminum alloy about said bottom portion to form a metal sidewall of said utensil, said bottom portion having a coefficient of thermal expansion substantially equal to the coefficient of thermal expansion of said metal sidewall.

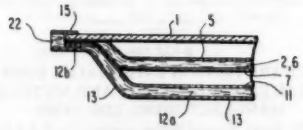
4,538,591
Patent Not Issued For This Number

4,538,592
SOLAR COLLECTOR

Carl R. Sundquist, Slättarödsvägen 4426, S-260 93 Torekov, Sweden

PCT No. PCT/SE83/00210, § 371 Date Jan. 27, 1984, § 102(e) Date Jan. 27, 1984, PCT Pub. No. WO83/04299, PCT Pub. Date Dec. 8, 1983
PCT Filed May 26, 1983, Ser. No. 581,192
Claims priority, application Sweden, May 27, 1982, 820381
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—450 **5 Claims**





1. A solar collector comprising a supporting panel, a transparent plate cover connected at its rim portion to said supporting panel, and an absorber element enclosed between said supporting panel and said plate cover, said supporting panel being compression molded of a fiber material which a thermosetting binding agent and having a generally plain bottom portion and a rim portion extending at an angle to said bottom portion and made integral therewith, characterized in that the density of the material of the supporting panel varies at different portions thereof in relation to the requirements of strength and thermal insulation such that the material is of a lesser density and has a greater thickness where the requirement of thermal insulation is high and is of a greater density and has a lesser thickness where the requirement of strength is high.

4,538,593
CONNECTING DEVICE

Fumiaki Ishii, Tokyo, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 563,646
Claims priority, application Japan, Dec. 28, 1982, 57-202530[U]
Int. Cl.³ A61B *1/00*
U.S. Cl. 128—4 **8 Claims**

1. A connecting device for connecting a gastight endoscope to a gas supply unit comprising:

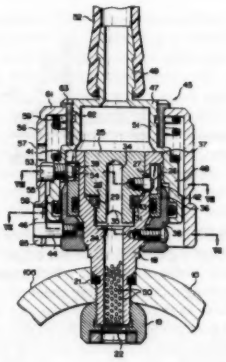
a first connector attached to the endoscope, said first connector including:

a communication pipe which is secured to the endoscope, and which has first and second ends communicating with the inside and outside of the endoscope, respectively, and the second end portion extending outward from the endoscope,

a first retainer projecting outward from the second end portion of the communication pipe,

a ring-shaped rotating body fitted to the outside of the second end portion of the communication pipe to be rotatable between first and second positions, and having an engaging portion on the outer peripheral surface thereof, and

a valve plug disposed in the communication pipe to be movable in conjunction with the rotation of the rotating body between a closing position where the valve plug closes the communication pipe and an opening position where the valve plug allows gas to flow through the communication pipe, the valve plug being located in the closing position when the rotating body is in the first position and in the opening position when the rotating body is in the second position; and



a second connector communicating with the gas supply unit and adapted to be connected to the first connector, said second connector including:

a substantially ring-shaped housing which is to be fitted to the first connector in a gastight manner, for rotation relative to the first connector, the housing having an engaging slit adapted to engage the first retainer when the housing is rotated after being fitted to the first connector, so that the housing is prevented from coming off of the first connector, and

a second retainer projecting inward from the housing, the second retainer being adapted to engage with the engaging portion of the rotating body when the housing is fitted to the first connector, and to rotate the rotating body to move the valve plug from the closing position to the opening position when the housing is rotated from the fitting position, the second retainer being allowed to engage with and disengage from the engaging portion only when the rotating body is in the first position.

4,538,594

RECTOSCOPE

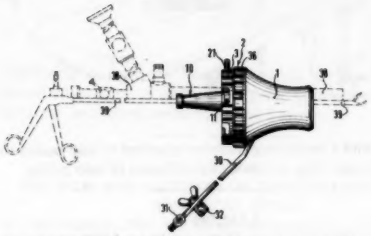
Manfred Boebel, Oetischheim; Manfred Baier, Bretten-Diedelsheim, and Gerhard Buess, Cologne, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Nov. 25, 1983, Ser. No. 555,155

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 8233240[U]; May 26, 1983, 3319049; Aug. 18, 1983, 3329784

Int. Cl.³ A61B 1/00

U.S. Cl. 128—6 **14 Claims**



1. Rectoscope for examination of the rectum and for intestinal surgery, comprising a short, wide tube equipped proximally with a coupling housing having means for connecting selectively to a mandrel for expanding the sphincter to the diameter of the tube and to an instrument carrier comprising axially parallel bores, an optical system for insertion into one of the bores and a needle holder and a sealing element for insertion into another of the bores, means for sealing said optical system, needle holder and sealing element in its associated bore, said sealing element comprising a cylinder portion associated with means for locking it, bayonet-fashion in a bore, said cylinder portion having joined to its proximal extremity a gas tight elastic extension which is closed off proximally by a sealing cap, auxiliary instruments being insertible through said extension and the tube into the rectum which may be inflated by means of a gas.

4,538,595

PASSIVE EXERCISING DEVICE

Muhamad A. Hajianpour, 2513 S.W. 27 Ave., Miami, Fla. 33135

Filed Feb. 21, 1984, Ser. No. 582,081

Int. Cl.³ A61H 1/00

U.S. Cl. 128—25 R **27 Claims**

1. A passive exercising device of the type designed to impart selective movement to a predetermined joint of a patient, said device comprising:

(a) brace means including at least a first and a second brace assembly each configured for securement to respective limbs of a patient's body adjacent to and on opposite sides of a predetermined joint thereof.

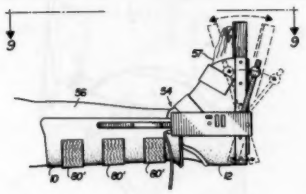
(b) drive means secured to said first brace assembly and including a drive motor and a gear assembly interconnected to said drive motor in driven relation thereto,

(c) casing means structured for supporting both said drive motor and gear assembly in interconnected relation to one another and configured to support said drive means as a substantially contained unit and further structured for securing said contained unit on said first brace assembly and said respective limb portion so as to move therewith,

(d) positioning means including an action arm means connected in driven relation to said drive means and extending therefrom into driving interconnection with said second brace assembly,

(e) control means interconnected in activating relation to said drive motor and structured to regulate sequence and directional operation thereof,

(f) said action arm means being structured to move in a path of travel substantially fixed relative to said casing means and disposed substantially parallel to a path of travel of



the respective limb portions secured to said second brace assembly as it moves about the predetermined joint relative to the limb portions secured by said first brace assembly upon preselected activation and control of said drive motor by said control means,

(g) said action arm comprising a substantially elongated configuration having one end interconnected in driven relation to said gear means, said action arm extending outwardly from said casing means a predetermined space distance into movable driving interconnection with said second brace assembly,

(h) attachment means for securing said action arm means to said second brace assembly and being rotatably secured to said second brace asembly and structured to slidably move along a portion of the length of said action arm means adjacent a distal end thereof,

(i) whereby selective movement of the predetermined joint is accomplished passively, independent of muscle control and actuation of the patient.

4,538,596

PROPHYLAXIS OF ADHESIONS WITH LOW FREQUENCY SOUND

David A. Colasante, 2050 Westgate Dr., F—3, Bethlehem, Pa. 18018

Filed Aug. 24, 1982, Ser. No. 410,922

Int. Cl.³ A61H 1/00

U.S. Cl. 128—32 **27 Claims**

1. A therapeutic method for reducing the incidence of adhe-

sions which are likely to form in regions of inflamed body tissue, comprising the step of exposing said tissues to low frequency sound to reduce the incidence of said adhesions, said exposure being periodic and occurring at least during a period of time when said body tissues are inflamed.

4,538,597

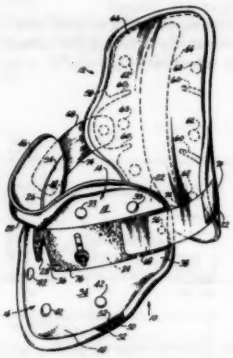
CERVICAL COLLAR

Max Lerman, 1950 Carla Ridge, Beverly Hills, Calif. 90210

Continuation-in-part of Ser. No. 511,841, Jul. 8, 1983,. This application Nov. 22, 1983, Ser. No. 554,351

Int. Cl.³ A61F *5/01*

U.S. Cl. 128—75 **9 Claims**



1. A cervical collar having an improved chin and lower jaw support, comprising:

a self-supporting shell preformed as a single piece of thin, semi-rigid material shaped to conform to the anatomical contour of the underside of the chin and lower jaw, the front portion of the neck, and the upper chest region; reinforcing means comprising an embossed region of the shell extending across the length of the neck region of the shell for increasing the stiffness of the neck region of the shell without increasing the wall thickness of the shell to resist, without collapse, downward forces on the chin and lower jaw-supporting section of the shell normally encountered to use; and a layer of an open cell containing material on the inside face of the shell.

4,538,598

THERAPEUTIC TRACTION DEVICE

Gerald G. Gill, 320 Upper Ter., San Francisco, Calif. 94117, and Donald G. Rhodes, 2747-21st St., San Pable, Calif. 94806

Continuation of Ser. No. 177,382, Aug. 12, 1982, abandoned. This application Sep. 16, 1982, Ser. No. 418,848

Int. Cl.³ A61H *1/02*

U.S. Cl. 128—75 **14 Claims**

1. A therapeutic traction device useable with a traction sling comprising:

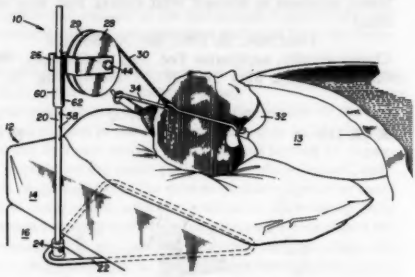
a. support means;

b. a pulley rotatably attached to said support means; said pulley having a grooved run;

c. a length of cord wound around said pulley; said cord having an end portion extending from said groove of said pulley and connecting to the traction sling;

d. spring means for spring loading said pulley, said spring means including a coil spring having one end which connects to said pulley and another end which is fixed with respect to said support means, said coil spring having laterally extending coils between said one and another ends; and

e. means for preventing rotation of said pulley beyond a predetermined angle; said means for preventing rotation of said pulley including a stop formed on said support



means and a projecting member attached to said pulley to contact said stop within one revolution of said pulley.

4,538,599

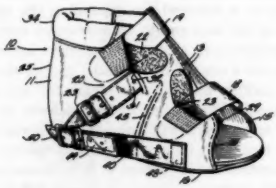
ORTHOSIS DEVICE FOR CONGENITAL METATARSUS

Peer Lindemann, 1736 Cherokee, West Bend, Wis. 53095

Filed Nov. 7, 1983, Ser. No. 549,169

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 A **8 Claims**



1. An orthosis device for corrective treatment of congenital metatarsus, comprising:

A. a shoe having toe and heel portions articulated for lateral movement of the toe portion relative to the heel portion, and having a sole to which said toe and heel portions are secured, said sole having a transverse cut therein defining said toe and heel portions and providing for lateral movement of the toe portion toward the outer side of the shoe, relative to the heel portion;

B. and force applying means connected with said toe and heel portions at the exterior of said outer side of the shoe, for exerting force on said toe portion in a direction parallel to the shoe sole, and tending to draw the toe portion laterally toward the outer side of the shoe relative to the heel portion.

4,538,600

ADJUSTABLE SPLINT

George R. Hepburn, Severna Park, Md., assignor to Dynasplint Systems, Inc., Baltimore, Md.

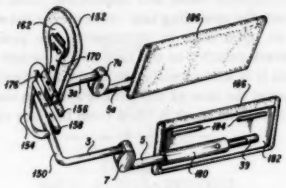
Filed Oct. 27, 1983, Ser. No. 545,848

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—88 **16 Claims**

1. An adjustable splint assembly comprising a lower strut and an upper strut pivotably connected to said lower strut, one of said struts having at one end a pivotably mounted head portion defining a cam surface, an adjustable biasing means mounted within the other strut and biased into engagement with said cam surface for applying a quantifiable force tending to align or approximate said upper and lower struts, a palmer pressure pad, means attached to said palmer pressure pad

providing both rotational and vertical adjustment of said palmer pressure pad and means connecting the palmer pressure pad to the end of the lower distal strut, said connecting means



containing at least one lateral adjusting bar for medial and lateral adjustment of said palmer pressure pad and means for securing said splint assembly to the forearm.

4,538,601

KIT FOR AND METHOD OF IMMOBILIZING THE CERVICAL SPINE

A. Paul Barker, 2701 S. 13th St., Arlington, Va. 22204

Filed Oct. 20, 1983, Ser. No. 543,836
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—89 R **16 Claims**

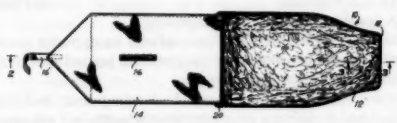
1. A kit for immobilizing the cervical spine comprising a first component and a second component, said first component comprises one or more straps wherein each strap is of sufficient length to extend alongside the lateral aspects o. the head and comprises a first portion which engages a body part of the head or neck area, and a second portion capable of lying alongside said lateral aspects of the head and having means for anchoring said first component to said second component, and said second component comprises a substance which can be extruded from a container in a semisolid state and which can mold to the contours of the anterior, superior and posterior aspects of the shoulders, the posterior and lateral aspects of the neck, and the lateral and posterior aspects of the head, before hardening into a rigid solid state.

4,538,602

LEG WRAP

Theodore Shapiro, One Bridle La., Sands Point, N.Y. 11050

Filed Jan. 5, 1984, Ser. No. 568,385
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—132 **5 Claims**



1. A leg wrap for a four-legged animal comprising:

an inner layer having an outer end and being of a length sufficient to be wrapped a plurality of times around the leg of the animal; an outer layer having an inner end secured to the outer end of said inner layer; and,

fastening means attached to said outer layer for holding the wrap closed when said inner and outer layers are wrapped in overlapping relation around the leg of the animal;

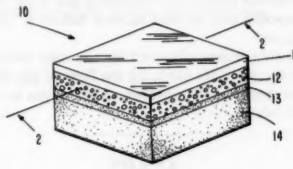
said inner layer being tapered toward its inner end so that said outer layer covers the hoof of the animal without restricting leg movement at the ankle joint when said inner and outer layers are wrapped in overlapping relation around the leg of the animal.

4,538,603

DRESSINGS, GRANULES, AND THEIR USE IN TREATING WOUNDS

John M. Pawelchak, East Windsor, and Frank M. Freeman, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 370,893, Apr. 22, 1982, abandoned.
This application Feb. 27, 1985, Ser. No. 705,859
Int. Cl.³ A61L *15/00*
U.S. Cl. 128—156 **11 Claims**



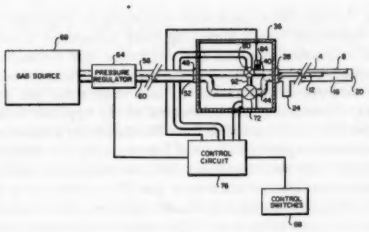
1. An occlusive multi-layered wound dressing consisting essentiallly of an adhesive layer which in use contacts the wound and the surrounding normal skin, an intermediate layer of semi-open cell polymeric foam bonded to the upper surface of said adhesive layer, and an outer moisture impervious polymeric film coated or laminated to the upper surface of said foam layer, wherein said wound and skin contacting adhesive layer consists of from about 35% to about 50% by weight of low molecular weight polyisobutylenes and from about 45% to about 65% by weight of one or more water dispensible hydrocolloids selected from the group consisting of sodium carboxymethylcellulose, calcium carboxymethylcellulose, pectin, gelatin, guar gum, locust bean gum, collagen, and gum karaya.

4,538,604

SYSTEM FOR ASSISTING RESPIRATION

Joe D. Usry, Midvale; James B. Bunnell, Salt Lake City, and Chris G. Faddis, West Valley, all of Utah, assignors to Bunnel Life Systems, Inc., Salt Lake City, Utah

Filed Jun. 20, 1983, Ser. No. 505,816
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—204.23 **5 Claims**



1. In an arrangement for assisting a person's respiration including a source of gas under pressure, apparatus for deliver-

ing gas pressure pulses to a person's respiratory system comprising

an elongate, tubular manifold, a first end of which is for insertion into the mouth and throat of the person and a second end adapted to extend from the mouth of the person,

a first lumen defined in the manifold, one end of which terminates a distance from the first end of the manifold and the opposite end of which terminates adjacent the second end of the manifold,

a second lumen defined in the manifold, one end of which terminates nearer the first end of the manifold than does the first lumen and the opposite end of which terminates adjacent the second end of the manifold,

first conduit means coupled to a second end of the manifold for supplying gas from the source to said opposite end of the first lumen,

first valve means disposed in said conduit means adjacent to said second end of said manifold for interrupting the flow of gas through the conduit means to thereby produce gas pressure pulses which flow to the manifold,

pressure transducer means disposed at the opposite end of the second lumen adjacent to the second end of said manifold for detecting pressure in the manifold,

second conduit means for conveying gas from the source to the opposite end of said second lumen to clear out the lumen, and

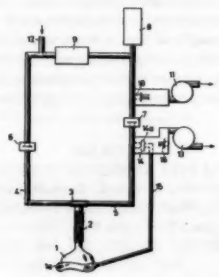
second valve means disposed in the said second conduit means for normally blocking the flow of gas therethrough and for periodically opening to allow gas to flow to the second lumen.

4,538,605

ANESTHETIC APPARATUS

Andras Gedeon, Täby, and Leif Odselius, Upplands Väsby, both of Sweden, assignors to Gambro Engström AB, Bromma, Sweden

Filed Mar. 8, 1983, Ser. No. 473,315
Claims priority, application Sweden, Mar. 18, 1982, 8201729
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—205.24 **4 Claims**



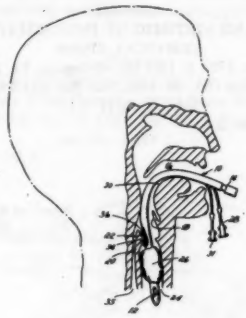
1. An anesthetic apparatus comprising an inspiration line and an expiration line, a breathing mask connected to one end of said inspiration line and said expiration line respectively, and adapted for placement over the face of a patient for connecting the airways of the patient to said inspiration and expiration lines, a ventilator unit connected to the opposite ends of said inspiration and expiration lines for supplying gaseous anesthetics to said inspiration line and for receiving gas exhaled by the patient from said expiration line, an inspiration valve in said inspiration line permitting a gas flow only in a direction towards said breathing mask, an expiration valve in said expiration line permitting a gas flow only in a direction away from said breathing mask, a gas suction device having a capacity at least corresponding to the greatest flow of gas which said ventilator unit can supply to said inspiration line at any given time, said gas suction device including a suction side through which suction may be applied, valve means connecting the suction side of said gas suction device to one of said expiration and inspiration lines at a point closer to said breathing mask than said expiration valve and inspiration valve respectively, control means for operating said valve means between a closed state and an open state in response to the position of said breathing mask relative to the face of the patient so that said valve means is in said closed state when the breathing mask is pressed against the face of the patient and is in said open state when said breathing mask is lifted from the face of the patient.

4,538,606

ENDOTRACHEAL TUBE

Robert E. Whited, 7157 Hamilton Hills Dr., Cincinnati, Ohio 45244

Filed Dec. 10, 1982, Ser. No. 448,632
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—207.15 **11 Claims**



1. An endotracheal tube adapted for insertion through the oral or nasal passage of a patient to provide a passage for artificial respiration comprising:

an elongated, flexible air tube having a proximal end portion adapted to be located external to the patient and a distal end portion adapted to be located within the trachea;

means for sealing the air tube with respect to the trachea, said sealing means being capable of sealing the trachea at a point spaced from the subglottis; and

cushioning means covering at least a portion of the external wall surface of said air tube and being located such that on insertion of said tube in said patient said cushioning means lies between the cricoarytenoid joint and said external wall surface of said air tube to prevent contact of said air tube with the cricoarytenoid joint to reduce the incidence and severity of cricoarytenoid trauma.

4,538,607

TRACHEOSTOMY VALVE

Aage E. Saul, Karlstad, Sweden, assignor to AB Fixfabriken, Göteborg, Sweden

Filed Feb. 6, 1984, Ser. No. 577,295
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—207.16 **16 Claims**

1. A tracheostomy valve, comprising

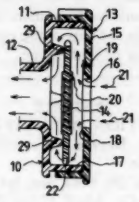
a housing having an open first end and an opposite second end, means for mounting the opposite second end of the housing to a tracheal cannula,

a cover movably mounted on the housing over said open first end to define a chamber therebetween and adjustable from a first position to at least a second position,

a disc-like-element within the housing and cover and arranged for reciprocation therebetween,

an air inlet/outlet formed in the cover communicating said

chamber with the surrounding atmosphere, said cover including means wherein said inlet/outlet is closed by said disc in the first position of the cover and for allowing a controlled air flow in said second position,



said mounting means including air-passage-forming-means on said housing for permanent communication between the tracheal cannula and said chamber formed by the housing and the cover.

4,538,608

METHOD AND APPARATUS FOR REMOVING CATARACTOUS LENS TISSUE BY LASER RADIATION

Francis A. L'Esperance, Jr., 255 Oakwood Rd., Englewood, N.J. 07631

Continuation-in-part of Ser. No. 592,710, Mar. 23, 1984, and a continuation-in-part of Ser. No. 592,709, Mar. 23, 1984, said Ser. No. 592,710, Continuation-in-part of Ser. No. 571,827. This application Jun. 6, 1984, Ser. No. 617,931

Int. Cl.³ A61B *17/36*

U.S. Cl. 128—303.1 **23 Claims**

1. Apparatus for surgical, non-invasive destruction of cataracted natural-lens tissue within an afflicted eye, comprising

viewing means having an optical objective on a viewing axis adapted for alignment with the afflicted eye,

a laser and optical means for treating the beam output of said laser to translate said output into a conical ray bundle convergent to a focal spot of maximum power density, said optical means including an axially movable element for providing Z-axis displacement of said focal spot,

a visible-light source and means including at least said movable element for translating visible-light output of said source into at least part of the conical-ray bundle convergent to said focal spot,

two-component scanning means interposed in said convergent-ray bundle for scan deflection of said focal spot in directions normal to the Z-axis, said scanning means and said optical means being so positioned as to place said focal spot at the cataracted lens with the viewing axis normal to the center of the field of two-component scan, said scanning means being adapted in a first selected mode for selective manipulation of displacement in each of the two component actions thereof, and said scanning means being adapted in a second selected mode for automated scan displacement of said focal spot under computer control and within said field,

whereby in said first mode and using the visible-light output of said source, said focal spot may be selectively and adjustably progressed in a visually observed path of displacement to develop a closed perimeter of desired limiting laser action on the cataracted lens,

computer means including a data-storage device and means for entering therein coordinate data for the observed development of said closed perimeter, said computer means including a program for control of the component actions of said scanning means as limited by said closed-perimeter data, and

variable means associated with said computer means for effecting predetermined shrinkage of the field area of programmed scanning, within said closed perimeter and as a function of Z-axis displacement of said focal spot.

16. A method of surgical, non-invasive destruction of cataracted natural lens tissue within an afflicted eye, said method comprising

(a) optically treating the beam output of a laser such that said beam output is translated into a conically convergent ray bundle to a focal spot of maximum power density,

(b) orienting said ray bundle to focus on said lens tissue via transmission through the cornea of the eye, whereby said maximum power density is focused at the lens tissue but the cornea and retina of the eye are exposed to relatively diffused and substantially reduced power density,

(c) exciting the laser to induce ablative photodecomposition and/or thermal decomposition and/or photofragmentation and/or photoemulsification via said maximum power density but at a level such that said diffused power density does not induce decomposition of tissue other than at the cataracted lens tissue, and

(d) scanning the cataracted lens tissue with said focal spot and within a predetermined limiting perimeter until ablative photodecomposition and/or thermal decomposition and/or photofragmentation and/or photoemulsification is substantially complete within said perimeter.

4,538,609

MANIPULATOR FOR LASER KNIFE

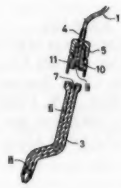
Shinya Takenaka, and Katsuyoshi Sunago, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 7, 1982, Ser. No. 396,174

Claims priority, application Japan, Jul. 7, 1981, 56-105077

Int. Cl.³ A61B *17/36*; G02B *5/14*

U.S. Cl. 128—303.1 **8 Claims**



1. A manipulator for a laser knife using an optical fiber light guide as a light conducting path, comprising;

an elongated hand piece detachably coupled to a forward portion of said optical fiber light guide, said hand piece being shaped to enable the part to be irradiated with said laser to be confronted with an end portion of said hand piece,

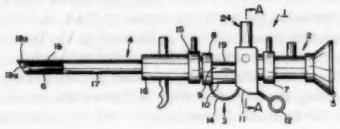
an elastic sleeve member comprising a continuous member positioned with a thickened portion abutting the opposite end portion of said hand piece, and being held to said fiber light guide under its own elastic force, and a connector disposed over said optical fiber light guide and said thickened portion of said elastic sleeve and adapted to couple said hand piece to said fiber light guide through said thickened portion of said elastic sleeve disposed between said connector and said fiber light guide, by pressing said thickened portion into close contact with said fiber light guide and said hand piece.

4,538,610

RESECTOSCOPE

Tetsumaru Kubota, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 454,653
Claims priority, application Japan, Jan. 14, 1982, 57-3506[U]
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.15 **6 Claims**



1. A resectoscope comprising:

(a) a resecting sheath insertable in a body;

(b) observing scope means positioned in said sheath for observing an affected portion of the body;

(c) electrode means having a forward end and rear end and positioned in said sheath for resecting the observed affected portion by a high frequency electrical current applied thereto by said forward end;

(d) electrode fixing means comprising an electrically conductive resilient fixing member having a slit therein for receiving the rear end of said electrode means, electrically insulating pressing means for pressing said resilient fixing member into engagement with said electrode means, and electrical plug receiving means with an opening therein, electrically connected to said fixing member, for receiving an electrical plug in the opening therein and electrically connecting the plug to said electrode means through said fixing member; and

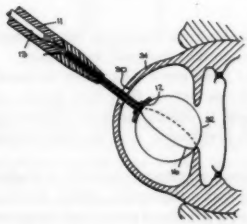
(e) electrically insulating movable means surrounding said fixing member, said movable means being movable with respect to said sheath such that the movement of said movable means moves said fixing member and said electrode means fixed therein, whereby the forward end of said electrode means extends out of said sheath.

4,538,611

SURGICAL INSTRUMENT AND METHOD OF CUTTING A LENS OF AN EYE

Charles D. Kelman, North Shore Towers, 269 Grand Central Pkwy., Bldg. 3, Floral Park, N.Y. 11005

Filed Jun. 13, 1983, Ser. No. 503,637
Int. Cl.³ A61B *17/32*
U.S. Cl. 128—305 **11 Claims**



1. A surgical instrument for cutting a lens of an eye comprising:

a first body member having a front end and having a second member movably supported in said first body member for movement between a forward position and a retracted position,

said first body member having at said front end a flange extending transversely thereto and said flange having a concave front face, and

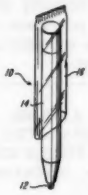
a snare loop extending outwardly through said front end of said first body member and said flange and having one end attached to one of said first and second body members and the other end attached to said second member, whereby said loop can be enabled to ensnare a lens of an eye and to cut the same while the lens of the eye is supported by said concave front face of said flange.

4,538,612

SKIN PREPARATION METHOD AND PRODUCT

Charles T. Patrick, Jr., Dayton, Ohio, assignor to NDM Corporation, Dayton, Ohio

Filed Aug. 29, 1983, Ser. No. 527,095
Int. Cl.³ A61B *17/00, 5/04*
U.S. Cl. 128—333 **12 Claims**



1. A product comprising a substantially moisture and air impervious container and a pencil-like device packaged in said container, said pencil-like device comprising a housing and a bundle of relatively stiff fibers gathered together by and retained in the housing, said gathered fibers being stiff enough to dislodge cells from the horny layer of skin and said housing having an opening through which ends of said fibers project outwardly from said housing, said container and said device being sterilized by irradiation so that upon removal of said device from said container said device will be substantially sterilized and useful for stroking the skin of a patient in preparation for application of an electrolyte for bridging the stroked skin to a signal conductor.

5. The method of preparing a subject for monitoring or treatment with an electrode, which method comprises the steps of:

gently stroking with a bundle of fibers a portion of an outer layer of the skin of the subject in a region overlying tissue to which electrical contact is to be made, said bundle of fibers being stiff enough to dislodge cells from the horny layer of skin and, in addition, being stiff enough to cause the stroked portion of skin to be marked by a change of color for moments following such stroking; and

thereafter locating the marked surface of skin and applying thereto electrolyte for bridging the marked skin to a signal conductor.

4,538,613

COHERENT BEAM COUPLER SYSTEM

Larry Rosenberg, 3440 Caroline Ave., Culver City, Calif. 90230

Filed Jan. 17, 1983, Ser. No. 458,740
Int. Cl.³ A61N *5/06*
U.S. Cl. 128—395 **42 Claims**

1. A system for diagnosing and treating aberrant organic sites comprising:

insertion means for insertion into the body of a subject wherein an aberrant site is located;

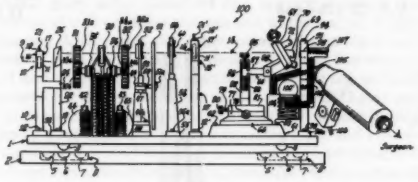
guide means for guiding said insertion means to a position adjacent said aberrant site;

first optical means in said insertion means for directing laser light to the aberrant site and for receiving from said aberrant site laser light reflected or re-emitted therefrom;

second optical means connected with said first optical means

for receiving laser light from said first optical means and directing said light to a selected location and for receiving laser light from a source thereof and directing said laser light to said first optical means, whereby said reflected or re-emitted laser light is analyzable by doppler analysis for diagnosis of said aberrant site and said laser light is directable toward said aberrant site for departicalization thereof;

conduit means connected to said first optical means for providing a flow of optically emissive moderator material and for aspirating said flow in selected directions relative to the transmission axis of said first optical means for supplying a protective barrier between said first optical means and the target site; and



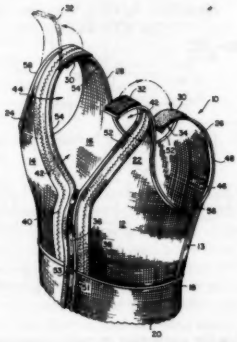
said conduit means includes pump means and sensor means, said pump means responding to said sensor means to displace optically opaque physiological materials within the subject wherein said target site is disposed and to replace said optically opaque physiological material with optically emissive infusate material such as to substantially maintain the ambient pressure in the region of said aberrant site and wherein said pump means is controlled to provide negative pressure of aspiration substantially equal to positive pressure of said infusate material, thereby providing a fluid barrier preventing thermal adhesion of unwanted organic constituents to said fiber optic means.

4,538,614

ATHLETIC GARMENT

Elizabeth Henderson, 1350 Beverly Rd., McLean, Va. 22101

Filed Jul. 12, 1983, Ser. No. 513,012
Int. Cl.³ A41C *3/00*
U.S. Cl. 128—494 **17 Claims**



1. An athletic garment comprising:

(a) at least one front panel for covering both breasts when worn, said front panel being made of a material elastic in all directions;

(b) a rear panel connected to said front panel for extending across the back of the wearer, said rear panel being made of elastic material, elastic in all directions;

(c) said front panel and said rear panel having a bottom edge, an elastic band secured to said bottom edge and the coextensive with said front and rear panels, said elastic band being elastic in the lateral direction, said band having an elasticity equal to or less than that of said panels for securing said garment about the torso of the wearer;

(d) said front panel having a first strap extending therefrom and a second strap extending therefrom spaced from said first strap, said straps configured to extend over the wearer's shoulders and provide a cut-out for the wearer's head and neck; and,

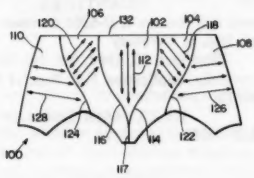
(e) separation means for providing separation for the breasts when the garment is worn while simultaneously providing the requisite support for athletic activity, said separation means extending from the top of the elastic band to the bottom of the cut-out for the wearer's head and neck and being substantially in the center of the front panel.

4,538,615

MULTIPANEL FOUNDATION GARMENT

Bernard Pundyk, So. Orange, N.J., assignor to Glamorise Foundations Inc., New York, N.Y.

Filed Jan. 20, 1984, Ser. No. 572,369
Int. Cl.³ A41C *1/00*
U.S. Cl. 128—555 **14 Claims**



1. A foundation garment having an upper opening and at least one lower opening as defined with respect to a wearer, the garment comprising a plurality of elastic fabric panels joined together along their respective adjacent edges to form an integral garment, each panel having a true elastic stretch only along one line, said panels including

a first elongate front panel having a longitudinal line of stretch with respect to a wearer and located at the central front portion of the garment;

second and third elongate side panels having a bias line of stretch with respect to said front panel and being joined along each side of said front panel; and

a rear section having lateral lines of stretch and forming the rear portion of the garment, the edges of said rear section being joined to the edges of said second and third panels.

4,538,616

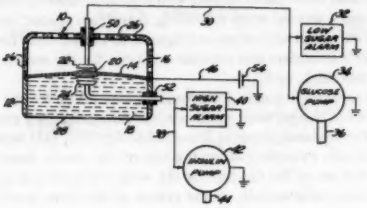
BLOOD SUGAR LEVEL SENSING AND MONITORING TRANSDUCER

Robert Rogoff, 223 Louella La., Nokomis, Fla. 33555

Filed Jul. 25, 1983, Ser. No. 517,065
Int. Cl.³ A61B *5/00*; A61M *1/03*
U.S. Cl. 128—632 **9 Claims**

1. A blood glucose sensor and monitor transducer comprising an enclosure implantable in the bloodstream of a person, an imperforate impermeable flexible diaphragm disposed in said enclosure and separating said enclosure into a first chamber open to the bloodstream and a second chamber, an osmostic semi-permeable membrane separating said second chamber from the bloodstream, a first electrical contact mounted on said diaphragm, a second electrical contact fixedly mounted in said first chamber and a third electrical contact fixedly mounted in said second chamber, and an osmostic solution filling said second chamber, whereby variations in glucose

level of the blood in the bloodstream causing variations in osmostic pressure of the blood causes transfer of liquid fluid from and into said second chamber through said semi-permeable membrane deflecting said flexible diaphragm in one direction and in an opposite direction causing said first electrical contact on said flexible diaphragm to engage said second or third fixed electrical contact according to the direction of deflexion of said flexible diaphragm.



4,538,617

TRANSDUCER FOR THE SIMULTANEOUS MEASUREMENT OF DIFFERENT PHYSIOLOGICAL QUANTITIES

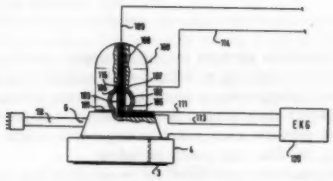
Arne Jensen, Am Hannes 4, D-6301 Grossen-Linden - Leihgestern, Fed. Rep. of Germany

Filed Oct. 13, 1982, Ser. No. 434,105

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140673

Int. Cl.³ A61B *5/00, 5/04*

U.S. Cl. 128—635 **5 Claims**



1. A device for the simultaneous measurement of at least two different physiological quantities of a human or animal body and being connectable to signal processing electronics, comprising:

a measuring head containing a transducer for measuring a first physiological quantity and a contact surface means for engaging with said human or animal body;

a first one of a pair of electrodes being located at the contact surface means to contact with said human or animal body together with said contact surface means and having means for electrically coupling to said signal processing electronics;

a second one of said pair of electrodes being attached to the measuring head outside said contact surface means thereof and having connection means for electrically coupling to said signal processing electronics;

a bipolar plug connection having first and second poles, said bipolar plug being removably fitted to said measuring head, said first pole being coupled to said second one of said pair of electrodes for coupling to said signal processing electronics by connection to said second one of said pair of electrodes and said second pole having means for electrically coupling to said signal processing electronics; and

an adhesive electrode body having two insulated juxtaposed electrodes each of which are adapted for contact with said human or animal body, said adhesive electrode body including a further removable bipolar plug connection having third and fourth poles, said third pole being coupled to one of said juxtaposed electrodes and said first pole and said fourth pole being coupled to the other of one of said juxtaposed electrodes and said second pole.

4,538,618

FLUID FLOW DETECTOR PARTICULARLY USEFUL FOR MICROVASCULAR MONITORING

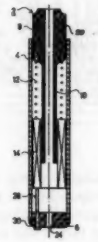
Lior Rosenberg, 13 Harduf St., and Jonathan Molcho, 29 Shikma St., both of Omer, Beer Sheva, Israel

Filed Feb. 23, 1984, Ser. No. 582,758

Claims priority, application Israel, Mar. 14, 1983, 68115

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—663 **11 Claims**



1. A fluid flow detector for the non-invasive detection of the flow of a fluid through an object, which detector is particularly useful for microvascular monitoring, comprising:

a head adapted to be placed against the object;

fluid-flow sensing means carried by said head for sensing the flow of fluid through the object when the head is applied against it; and

pressure transducer means carried by said head for measuring the pressure applied thereby against the object.

4,538,619

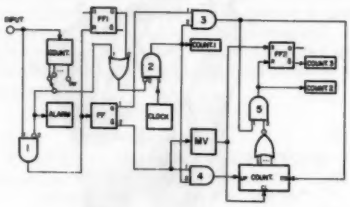
ANALYZER OF IMPULSE PROCESSES OF HEART ACTIVITY

Iosif Baumberg, 54 Bay 29 St., #5B, Brooklyn, N.Y. 11214

Filed Nov. 9, 1983, Ser. No. 549,889

Int. Cl.³ A61N *5/04*

U.S. Cl. 128—702 **4 Claims**



1. A device for analyzing impulse processes of heart activity such as for determining an index of arrhythmia, comprising

an input terminal for receiving a sequence of input pulses to be analyzed; a first AND gate having an input, an inverted input and an output; a counter having an input connected with said input terminal and a plurality of outputs; a multi-position switching means connected between respective outputs of said switching means and the inverted input of said first AND gate; signalling means connected to the inverted input of said first AND gate; a counting trigger

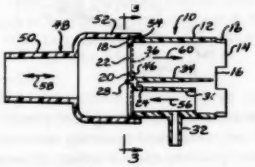
having an input and two outputs; a first flip-flop circuit having a set and a reset input and two outputs; the output of said first AND gate being connected to the input of said counting trigger and to the reset input of said flip-flop circuit; an OR gate having an input connected to one output of said flip-flop circuit, another input connected to the inverted input of said first AND gate, and an output; a second AND gate having an inverted input connected to the output of said OR gate, another input and an output; a clock pulse generator connected to the other input of said second AND gate; a plurality of reading counters each having an input and a count display; a third AND gate, a fourth AND gate and a fifth AND gate each having two inputs and an output; an up-down counter having a plurality of inputs and outputs, one input of said third and fourth AND gates being connected to a respective one of the inputs of said up-down counter and to the output of said second AND gate; the other inputs of said third and fourth AND gates being connected to respective outputs of said counting trigger; a multivibrator having an input connected to the other input of said fourth AND gate and an output; said inputs of said UP-DOWN counter having an up counting input, a down counting input and a clearing input; a second flip-flop circuit having a set input and a reset input, the set input being connected to the output of said multivibrator and to said clearing input; a NOR gate having a plurality of inputs connected to respective outputs of said UP-DOWN counter; and an output connected to an input of the fifth AND gate, the other input of the latter gate being connected to the output of said third AND gate and to said down counting input; the output of said fifth AND gate being connected to the reset input of said second flip-flop circuit and to a second one of said reading counters; and the output of said second flip-flop circuit being connected to a third of said reading counters.

4,538,620

INHALATION VALVE

Christopher Nowacki, Arlington Heights, and Alfred G. Brisson, Schaumburg, both of Ill., assignors to Trutek Research Inc., Arlington Hts., Ill.

Filed May 13, 1983, Ser. No. 494,256
Int. Cl.³ A61B 5/08
U.S. Cl. 128—725 **4 Claims**



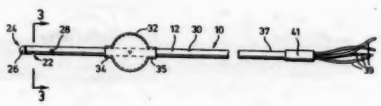
1. An inhalation valve comprising a cylindrical body of predetermined diameter to provide bidirectional flow therethrough and having an open first end and an open second end, a cylindrical mouthpiece joined to said body at said second end and forming a straight-through continuation of said body, a flow tube substantially smaller diameter than said predetermined diameter disposed within said body adjacent to and connected to one side thereof and oriented axially thereof and open at both ends providing an inhalation flow path through said body, partition means disposed substantially diametrically of said body and extending substantially from said first end substantially to said second end and demarcating a portion of said body exteriorly of said tube as an exhalation flow path, a single substantially circular flexible diaphragm, means mounting said diaphragm substantially diametrically thereof at the second end of said body with first and second portions of said diaphragm respectively lying across said inhalation and said exhalation flow paths, a transverse wall covering substantially half of said second end of said body and through which said flow tube opens, said wall being upstream of said diaphragm and forming a back-up for the second portion of said diaphragm to prevent exhalation through said flow tube and permitting flexing of said second portion of the diaphragm to permit inhalation through said flow tube, back-up means downstream of said diaphragm for the first portion of said diaphragm permitting flexing of said diaphragm first portion upon exhalation and backing up said diaphragm first portion upon inhalation to permit exhalation but prevent inhalation through said exhalation flow path, and means extending laterally through said flow tube and said body providing a lateral opening from said flow tube to permit detecting a lateral pressure drop upon inhalation.

4,538,621

URODYNAMIC CATHETER

Henry N. Jarczyn, Ontario, Canada, assignor to Urotek Inc., Mississauga, Canada

Filed Jan. 25, 1983, Ser. No. 460,769
Int. Cl.³ A61B 5/00
U.S. Cl. 128—748 **10 Claims**



1. A urodynamic catheter for conducting urodynamic tests, comprising:

a tube of uniform diameter having at least four lumens and a closed leading end for intra-urethral insertion,

a first one of said lumens communicating with a first side opening in the tube spaced a first distance from said leading end,

a second one of said lumens communicating with a second side opening in the tube spaced a second distance from said leading end, said second distance being greater than said first distance,

one of said first and second lumens being adapted to admit a liquid into the bladder, the other being adapted to monitor bladder pressure,

a third one of said lumens communicating with a single third side opening in the tube, spaced a third distance from said leading end, said third distance being greater than said second distance, the third lumen being adapted to determine an urethral pressure profile (UPP), and

a fourth one of said lumens communicating with the interior of an inflatable balloon attached to the tube, the balloon being located between said second and third openings and being adapted, when inflated, to retain the catheter in place with respect to the bladder.

4,538,622

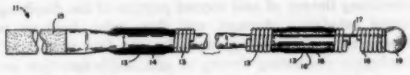
GUIDE WIRE FOR CATHETERS

Wilfred J. Samson, Saratoga, and Ronald G. Williams, Mountain View, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Nov. 10, 1983, Ser. No. 550,917
Int. Cl.³ A61B 10/00; A61M 25/00
U.S. Cl. 128—772 **10 Claims**

1. In a guide wire, an elongate solid flexible cylindrical element formed of metallic material having high torsional capability and having a proximal portion ranging from 0.008 to 0.020 inches a distal portion having a diameter of less than 0.007 inches and an intermediate tapered portion, a coil formed of metallic material and secured to said distal portion and an additional coil formed of a material which is different from the material of which the first named coil is formed means, secur-

ing the proximal extremity of the additional coil to the distal extremity of the first named coil and means having a rounded



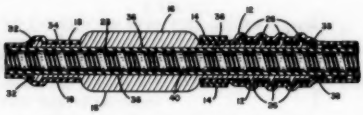
conformation secured to the distal extremity of the last named coil, the additional coil being formed so that it is more flexible than the first named coil and being substantially radiopaque.

4,538,623

THREAD ELECTRODE ASSEMBLY

Keith J. Proctor, Fridley, and John D. Doring, Spring Lake Park, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 9, 1984, Ser. No. 597,953
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—784 **6 Claims**



1. An electrode lead comprising:
a coiled conductor having a proximal end and a distal end;
a tubular insulative sheath having a proximal end, a distal end, and a central lumen in which said coiled conductor is located; and
an electrode mounted to the distal end of said insulative sheath and having a distal portion exposed to the exterior of said insulative sheath and a cylindrical portion proximal to said distal portion, located within the lumen of said insulative sheath, wherein said cylindrical portion of said electrode is provided with a helical screw thread and said coiled conductor is mounted around said cylindrical portion, the coils of said coiled conductor lying between the coils of said helical screw thread, the threads of said helical screw thread extending radially beyond the coils of said coiled conductor and said cylindrical portion of said electrode having an outer diameter greater than the inner diameter of said coiled conductor in its relaxed state.

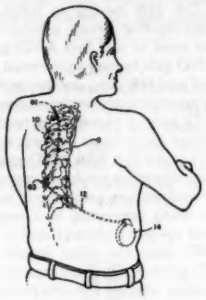
4,538,624

METHOD FOR LEAD INTRODUCTION AND FIXATION

Peter P. Tarjan, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Dec. 8, 1982, Ser. No. 448,006
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—784 **12 Claims**

1. A method of introduction of a percutaneous conductive lead into the body of a patient for implantation of the lead therein, including:
inserting first and second hollow needles through the skin of the patient to a subcutaneous depth at which the lead is to be fixed; the tips of said needles being spaced from each other on opposite sides of a location to be stimulated by said lead;
positioning the tips of said needle; to face each other;
inserting a surrogate lead through said first hollow needle;
passing said surrogate lead through the patient's body until its leading distal end is adjacent the tip of said second needle;
inserting a snare through said second needle and snaring the leading distal end of said surrogate lead;
pulling said snare and snared leading distal end of said surrogate lead through said second hollow needle so that said surrogate lead extends from the patient's body through both of said hollow needles;



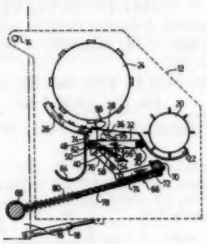
attaching one end of said surrogate lead to an end of the conductive lead; and pulling said surrogate lead to pull said conductive lead into the body of the patient.

4,538,625

STONE GUARD DOOR FOR HARVESTERS

Douglas N. Fortune, and Barry R. Ireland, both of Wingham, Canada, assignors to Soil Mate Equipment Ltd., Wingham, Canada

Filed Jul. 11, 1984, Ser. No. 629,876
Int. Cl.³ A01F *12/00*
U.S. Cl. 130—27 JT **6 Claims**



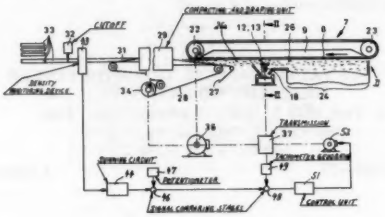
1. A harvester having a threshing head pivotally mounted at the front end for raising and lowering movement between a lower operative position and an upper inoperative position, said threshing head comprising a rotatable threshing cylinder, a concave adjacent to and spaced from the threshing cylinder, means for feeding crop along a flow path to the space between the threshing cylinder and the concave, a stone guard door in the flow path, latch means normally retaining the door in a closed position, and operable by a stone above a predetermined size to cause opening of the door and discharge of the stone from the flow path before the stone enters the space between the threshing cylinder and the concave, and door closing means connected between the door and the front end of the harvester and operable by movement of the threshing head to a raised position to effect closing of the door, said door closing means comprises spring means tensioned by initial raising movement of the threshing head, and catch means operable to prevent closing movement of the door during initial raising movement of the head and released by raising movement of the threshing head beyond an initial raised position to cause the door to be shut by energy provided by said tensioned spring means.

4,538,626

APPARATUS FOR TRIMMING A TOBACCO STREAM

Alfred Hinzmann, Weams, Va., assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Apr. 8, 1983, Ser. No. 483,371
Int. Cl.[3] A24C *5/14*
U.S. Cl. 131—84.4 12 Claims



1. Apparatus for removing the surplus of tobacco or like fibrous material from a continuous stream, comprising conveyor means for moving the stream lengthwise; surplus segretating means comprising at least one rotary disc having a marginal portion extending into the moving stream so that the surplus of fibrous material extends beyond one side of the disc; means for driving said conveyor means at a first speed; means for imparting to said disc a peripheral speed exceeding said first speed; and means for varying the ratio of the speed of said conveyor means to the peripheral speed of said disc.

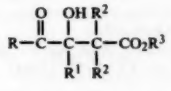
4,538,627

SMOKING COMPOSITIONS CONTAINING A β-HYDROXY-γ-KETOESTER FLAVORANT-RELEASE ADDITIVE

W. Geoffrey Chan, and Yoram Houminer, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Oct. 25, 1984, Ser. No. 664,821
Int. Cl.[3] A24B *3/12, 15/30*
U.S. Cl. 131—276 11 Claims

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and tobacco substitutes, and (2) between about 0.0001 and 2 weight percent, based on the total weight of filler, of a β-hydroxy-γ-ketoester flavorant-release additive corresponding to the formula:



where R and R^1 are substituents selected from aliphatic, alicyclic and aromatic radicals containing between about 1–12 carbon atoms, and R and R^1 when taken together with connecting elements form an alicyclic structure; each of R^2 is hydrogen or a substituent selected from aliphatic, alicyclic and aromatic groups containing between about 1–16 carbon atoms; R^3 is a substituent selected from aliphatic, alicyclic and aromatic radicals containing between about 1–16 carbon atoms; and at least one of R^2 and R^3 is a substituent containing between about 5–16 carbon atoms.

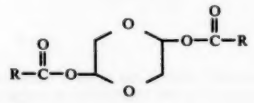
4,538,628

SMOKING COMPOSITIONS CONTAINING A DIOXANE DIESTER FLAVORANT-RELEASE ADDITIVE

Kenneth F. Podraza, Richmond, Va., assignor to Philip Morris, Incorporated, New York, N.Y.

Filed Oct. 10, 1984, Ser. No. 659,464
Int. Cl.[3] A24B *15/40*
U.S. Cl. 131—277 7 Claims

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and tobacco substitutes, and (2) between about 0.0001 and 2 weight percent, based on the total weight of filler, of a dioxane diester flavorant-release additive corresponding to the formula:



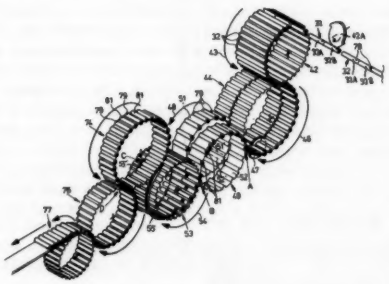
where R is a substituent selected from aliphatic, alicyclic, aromatic and substitued aromatic radicals containing between about 1–12 carbon atoms.

4,538,629

METHOD AND APPARATUS FOR THE PRODUCTION AND MANIPULATION OF PLAIN CIGARETTES AND THE LIKE

Hans-Jochen Grasse, Wentorf, and Rolf Gömann, Dassendorf, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,406
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224897
Int. Cl.[3] A24C *5/32*
U.S. Cl. 131—282 22 Claims



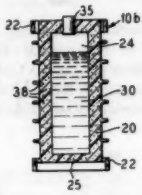
1. A method of producing plain cigarettes of unit length or analogous rod-shaped articles which constitute or form part of smokers' products, comprising the steps of forming a continuous rod including draping a web of wrapping material around a rod-like filler; advancing the rod axially; subdividing the advancing rod into a file of coaxial sections of n times unit length wherein n is a whole number including one; converting the file into a plurality of rows of parallel sections and advancing said rows so that their sections move sideways; and shuffling the sections of said rows so as to convert the rows into a single row of parallel sections, including moving the sections of at least one of said plurality of rows axially.

4,538,630

MICROWAVE HEATED HAIR CURLER

Gordon W. Henderson, 240 S. Case Ave., Westmont, Ill. 60559

Filed Mar. 10, 1983, Ser. No. 474,134
Int. Cl.[3] A45D *2/12*
U.S. Cl. 132—33 R **12 Claims**



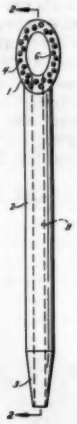
1. A self-contained, sealed, microwave heatable hair winder comprising a spool of a low loss dielectric material adapted to receive hair therearound and containing a lossy dielectric material in an amount to quickly heat the spool to operating hair curling temperatures when exposed to a microwave field.

4,538,631

ORAL HYGIENE INSTRUMENT

Mary F. Prince, 1839 Neimann Dr., Cape Girardeau, Mo. 63701

Filed Apr. 29, 1983, Ser. No. 490,230
Int. Cl.[3] A45D *44/18;* **A46B** *13/20*
U.S. Cl. 132—84 R **6 Claims**



1. An aspirating tooth and mouth brush instrument for use with a suction system in providing oral hygiene to persons unable to assume an upright position or by handicapped or disabled persons, comprising:

(a) an elongated tubular handle sized for gripping and control by the fingertips of a single human hand, the handle having a first closed end with a first opening projecting in a radial direction from the axis of the tubular handle at a position near the first end;

(b) a plurality of bristles projecting substantially perpendicular to a plane extending along the axis of the handle, the bristles forming a tooth and mouth brush and surrounding the first opening, the bristles having a softness suitable for brushing the mouth and gums;

(c) the handle having a second end, the handle having a second opening for connection to the suction system;

(d) the handle having a bore extending from flow connection to the first opening to flow connection with the second opening so that the suction system can draw fluid from the mouth through the first opening thence through the bore to the second opening; and

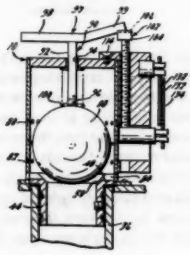
(e) the handle and the brush being unencumbered by any adjoining structure and having no means for injecting fluid into the mouth, and sized to be easily inserted through the mouth opening into the mouth, and easily maneuvered and positioned within the mouth to contact any desired portion of a tooth.

4,538,632

SHUTOFF VALVE FOR FUEL TRUCK OR TANKER DRAIN OFF DOWNSPOUTS

Dennis A. Vogl, 6625 N. M-52, Henderson, Mich. 48841

Filed Oct. 17, 1983, Ser. No. 542,598
Int. Cl.[3] F16K *13/04*
U.S. Cl. 137—77 **5 Claims**



1. In a shutoff valve for fuel truck and tanker drain off downspouts, the combination including a base having a cylindrical tubular portion and an integral flange portion projecting radially outwardly from said tubular portion, said base including a valve seat located at the inner junction of said tubular portion with said flange portion, said tubular portion defining an outlet passageway communicating with said valve seat, means for connecting said tubular portion of said base to a downspout, a housing fixed to said base, said housing including a cylindrical peripheral wall and a top wall defining a chamber, said peripheral wall of said housing including a plurality of inlet openings communicating with said chamber, a ball valve disposed in said chamber and adapted to seat against said valve seat, means including a coil spring biasing said valve towards said valve seat, means including handle means for manually opening said valve, an adjustable stop member carried by said housing and engageable by said handle means whereby said valve is held away from said valve seat, and fusible means effective to disable said stop means in the event of a fire and permit said ball valve to engage said valve seat.

4,538,633

OPTICAL-HYDRAULIC CONTROL SYSTEM

Curtis E. Stevens, Irvine, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Feb. 18, 1983, Ser. No. 467,690
Int. Cl.[3] F15B *13/043*
U.S. Cl. 137—85 **24 Claims**

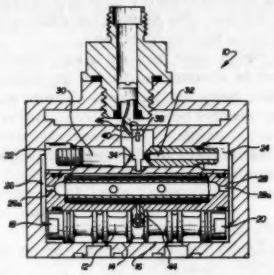
1. A servovalve having a valve spool that is controlled in response to differential pressure between two ports, said servovalve comprising:

a valve body that includes at least two fluid ports that are respectively in communication with two fluid chambers;

means for controlling relative fluid pressure in said fluid chambers by selectively controlling the fluid through said fluid ports;

a thermally sensitive beam structure that is mechanically connected to said valve body and to said controlling means, said beam structure maintaining said controlling

means with respect to said fluid ports in response to the thermal state of said beam structure; and



optical means for selectively illuminating the thermally sensitive beam structure to control the location of said controlling means with respect to said fluid ports.

4,538,634

VACUUM PULSATOR VALVES

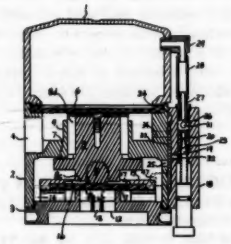
Thomas L. Seaborne, 10 Collier Crescent, Brunswick, Victoria, Australia

Division of Ser. No. 349,153. This application Jul. 16, 1984, Ser. No. 631,243

Claims priority, application Australia, Feb. 13, 1981, 7594/81

Int. Cl.³ A01J *5/10*

U.S. Cl. 137—103 **12 Claims**



1. A relay valve control means for transmitting pulses of vacuum alternately with non-vacuum pulses between a pair of pulsators, each said pulsator comprising a body including means for connecting a first zone of said body to a permanent vacuum source and a diaphragm valve comprising a first valve element cooperating with a first valve seat adapted to connect a second zone of said body to a non-vacuum source of air, said body further including a second valve seat adapted to be opened or closed to establish or prevent communication between said first and second zones, said body further housing a first deformable diaphragm having first and second opposed surfaces with said first surface arranged for exposure to said permanent vacuum source and cooperating with said first valve element whereby said first valve element is movable such that said first valve seat is open for at least a major portion of the time during which said second valve seat is closed thereby applying non-vacuum air to said second zone, and when said second valve seat is open, said first valve seat is closed thereby applying vacuum to said second zone, said relay valve control means enabling communication of the second zone of one of said pulsators with the second surface of the first deformable diaphragm of the other of said pulsators, said communication occurring via a non return valve and an adjustable valve means arranged in parallel flow relation.

4,538,635

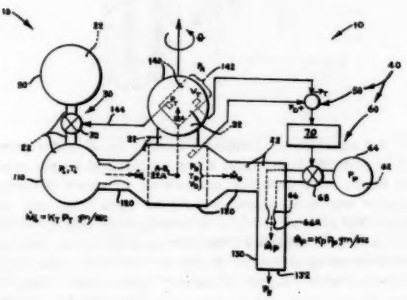
LASER BEAM DUCT PRESSURE CONTROLLER SYSTEM

Arnold J. Laderman, Laguna Beach, and Frederick M. Bergthold, Jr., Tustin, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1983, Ser. No. 539,352

Int. Cl.³ H01S *3/03*

U.S. Cl. 137—114 **4 Claims**



1. A laser beam duct pressure controller system for maintaining a spatially uniform pressure in a flowing gas volume subjected to temporal pressure variations, wherein said flowing gas volume flows transversely from a plenum chamber into a laser beam duct in communication with said plenum chamber, and wherein some of said flowing gas volume flows from said laser beam duct into a rotatable compartment and most of said flowing gas volume flows into an exhaust duct, both of which are in communication with said laser beam duct, and also wherein said rotatable compartment has a gas volume which is to be maintained at a preselected pressure and an aperture which is exposed to an external pressure, whereby a resultant pressure gradient is introduced by changes in said pressure of said gas volume in said rotatable compartment, and thereby inducing significant undesired axial gas flow motion in said laser beam duct which can result in serious optical degradation, said laser beam duct pressure controller system comprising:

a. a source of conditioning gas under high pressure in communication with said plenum chamber;

b. means, interposed between and in communication with said plenum chamber and said source of conditioning gas under high pressure, for selectively allowing said conditioning gas to flow from said source thereof into said plenum chamber, whereby said gas flow feeds into said laser beam duct, and thereby a laser beam duct pressure results; and

c. means, operably associated with said rotatable compartment, and with said laser beam duct, and also with said exhaust duct, for maintaining said laser beam duct gas flow pressure equal to said preselected pressure of said gas volume in said rotatable compartment, whereby said undesired axial gas flow motion in said conditioning gas in said laser beam duct is eliminated.

4,538,636

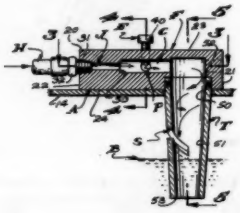
LIQUID ASPIRATOR WITH IMPROVED ANTI-SYPHON TUBE

Robert K. Cleland, 11051 Via El Mercado, Los Alamitos, Calif. 90720

Continuation-in-part of Ser. No. 405,424, This application Apr. 30, 1984, Ser. No. 605,297

Int. Cl.³ F16K *19/00*

U.S. Cl. 137—216 **5 Claims**



1. An aspirator to combine a motive liquid under pressure and an additive liquid from a non-pressurized supply of additive liquid, said aspirator comprising structure defining an elongate aspirating chamber with an open front end and a closed rear end, an elongate nozzle passage smaller in cross-section than the chamber with a forward discharge end aligned with an opening at the rear end of the chamber and a rear end connected with a supply of motive liquid under pressure, an elongate inlet port with an inner end communicating with the chamber between the ends thereof and an outlet end connected with a supply of additive liquid, said nozzle passage directs a jet of motive liquid forwardly through and from the chamber, said jet establishes a minus pressure in the chamber, said minus pressure draws additive liquid through the port into and forwardly through the chamber with said motive liquid, an elongate vertical delivery tube greater in cross-section than the chamber with an upper end communicating with the front end of the chamber, said tube has a downwardly and radially inwardly tapered cylindrical inside surface and a downwardly opening lower end and in which the force of gravity and the residual work energy in the motive liquid downstream of the chamber work to advance the liquids issuing from the chamber downwardly through and from the tube in advance of the liquids issuing from the chamber, the tapered inside surface of the tube causes the flow of liquids downwardly therein to establish a vortex flow and said vortex flow establishes a minus pressure centrally and within the upper portion of the tube downstream of the front end of the chamber which induces the free flow of liquids in and from the chamber, the lower end portion of the tube extends into and opens within a volume of liquid within a liquid containing structure to which the liquids delivered from the aspirator are added, said tube is formed with an elongate vertically and circumferentially extending radially inwardly and outwardly opening anti-syphon vent slot communicating with the interior of the tube and with the atmosphere outside of said tube above said volume of liquid.

4,538,637

FREEZE PROOF FAUCET

Robert F. Williams, 7505 E. Atherton, Davison, Mich. 48473

Filed Feb. 28, 1983, Ser. No. 470,098

Int. Cl.³ F16L *5/00*

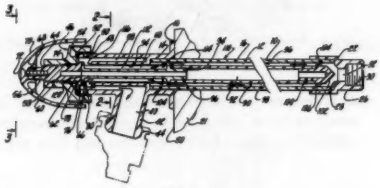
U.S. Cl. 137—360 **7 Claims**

1. A faucet adapted to be mounted to a wall having an exterior surface comprising:

an elongated tubular plastic housing defining an interior housing chamber, one end of said housing chamber open to a fluid inlet and a fluid outlet open to said housing chamber adjacent the other end of said housing, said fluid inlet open to a valve seat, closely adjacent said one end of said housing chamber,

means for mounting said housing to the wall so that said one housing end extends inwardly from said exterior surface of the wall and said other housing end extends outwardly from the exterior surface of the wall,

an elongated plastic valve member having a valve face at one end and an abutment surface at its other end, said valve member being longitudinally slidably mounted in said housing chamber between a closed position in which said valve face abuts against and closes said valve seat, and an open position in which said valve face is spaced from said valve seat, and



a plastic valve actuator having a pusher surface, means for mounting said valve actuator to the other end of said housing so that said valve actuator is movable between an axially retracted position in which said pusher surface engages said abutment surface and urges said valve face against said valve seat, and an axially extended position in which said pusher surface is spaced from said valve seat by a distance greater than the length of said valve member, said valve member and said actuator being free to move longitudinally with respect to each other when said valve actuator is in said extended position,

wherein said valve member is dimensioned so that said pusher and abutment surfaces are spaced outwardly from said exterior wall surface.

4,538,638

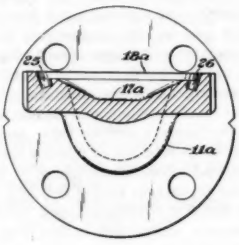
PLASTIC LINED DIAPHRAGM VALVE

Eugene V. Stack, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 8, 1984, Ser. No. 587,714

Int. Cl.³ F16K *1/00*

U.S. Cl. 137—375 **4 Claims**



1. An improved plastic lined diaphragm valve, the diaphragm valve comprising a body portion, the body portion having a first end and a second end, the passageway extending from said first end to said second end, the body portion defining a weir, the weir extending in a direction generally perpendicular to a longitudinal axis of the passageway, the body defining an intermediate opening at a location generally opposite the weir; about the opening opposite the weir a bonnet receiving surface, the bonnet receiving surface being of annu-

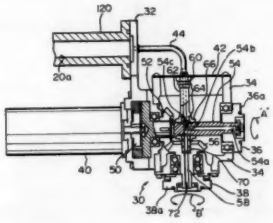
lar configuration, a plastic lining disposed within the body, the lining extending out of said body and covering at least a portion of the bonnet receiving surface, a bonnet assembly affixed to the bonnet receiving surface; the improvement which comprises the bonnet receiving surface of the body defining at least a first and second recess, said first and second recesses being generally diametrically opposed, and generally adjacent the weir with the further limitation that the plastic lining extends into said recesses.

4,538,639

ROBOT WRIST OF AN INDUSTRIAL ROBOT

Hajimu Inaba, Hino; Shigemi Inagaki, Musashino, and Susumu Ito, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jun. 23, 1982, Ser. No. 391,447
Claims priority, application Japan, Jun. 30, 1981, 56-100502
Int. Cl.³ F16L *27/00*
U.S. Cl. 137—580 **7 Claims**



1. A robot wrist attached to an end of a robot arm of an industrial robot for attaching thereto a manipulative robot hand, comprising:

a wrist housing means for supporting therein first and second rotating output shafts, each shaft having an output end disposed in one of two substantially orthogonal end faces of said housing means, said output shafts also being substantially orthogonal to one another with the axes thereof intersecting at a point;

a rotation drive means secured to said wrist housing means and directly driving said first rotating output shaft;

a first bevel gear mounted on said first output shaft;

a second bevel gear operatively engaged with said first bevel gear mounted on said second rotating output shaft, to drive said second rotating output shaft;

fluid conduit means provided in each of said first and second output shafts for providing pressurized fluid to the output ends thereof for operating the manipulative robot hand;

means for conveying the pressurized fluid from outside said wrist housing to said fluid conduit means; and

coupling means for providing a tight connection between said conveying means and said fluid conduit means.

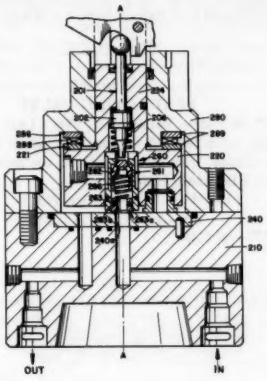
4,538,640

MULTIPOSITION SELECTOR VALVE

Richard C. Acker, Chagrin Falls, Ohio, assignor to Teledyne Republic Manufacturing, Cleveland, Ohio

Continuation-in-part of Ser. No. 351,996. This application Sep. 30, 1982, Ser. No. 430,770
Int. Cl.³ F15B *11/00*; F16K *31/44*
U.S. Cl. 137—596 **12 Claims**

1. In a valve having a leverlike operating handle pivotally mounted on the valve, and a linearly movable push rod element actuated by the handle and extending into the interior of the valve to engage and operate a check valve assembly contained therein, the improvement comprising a rigid ball loosely retained between the handle and the push rod by cage-forming elements extending from the valve and surrounding said ball, load bearing areas of contact between said ball and the push rod and said ball and the handle being minimized to limit frictional forces between said ball, the push rod and the handle, pivotal movement of the handle applying a moving force to the push rod solely via the ball to open the check valve assembly wherein the diameter of the ball is greater than the diameter of



the push rod portion engaging the ball, wherein movement of the push rod is limited by engagement of the ball with a portion of the valve slidably receiving the push rod, such portion of the valve functioning as a stop to preclude movement of the ball and thus the push rod

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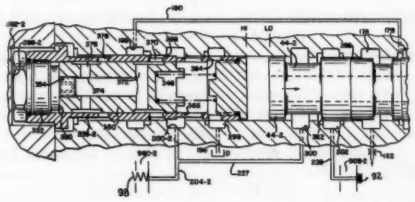
4,538,641

CLUTCH-CLUTCH-BRAKE STEERING MECHANISM FOR TRACTORS

Probir K. Chatterjea, Mt. Prospect, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 526,195, is a division of Ser. No. 287,539, Jun. 22, 1981, Pat. No. 4,428,468, which is a continuation-in-part of Ser. No. 176,815, Aug. 11, 1980, Pat. No. 4,372,408, which is a continuation of Ser. No. 951,690, Oct. 16, 1978, abandoned. This application Aug. 23, 1984, Ser. No. 643,342
Int. Cl.³ F15B *13/06*
U.S. Cl. 137—596.1 **4 Claims**



1. For use in a fluid pressure system including high pressure, drain pressure, and common clutch-brake, inlet-outlet conduits:

pressure setting valve assembly means having a bore therein communicating with said conduits and controllably connecting the high and drain pressure conduits for generating a common clutch-brake pressure in the inlet-outlet conduit;

said valve assembly means including a metering spool disposed in said bore and actuating means for selectively moving said spool within said bore, said actuating means being responsive to the generation of said common clutch-brake pressure to move said spool for affording inlet-outlet flow in said inlet-outlet conduit; and

a shuttle in the spool having first and second operating positions, said spool including bypass means communicating with said drain conduit, and spool actuating means for placing said shuttle in said first position for communicating said inlet-outlet conduit with said bypass means and in said second operating position for blocking communication between said bypass means and said inlet-outlet conduit.

4,538,642

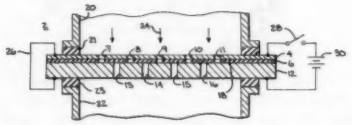
FAST ACTING VALVE

Herman P. Schutten, Milwaukee, Wis.; Lyle O. Hoppie, Birmingham, Mich.; David Turner, Bloomfield Hills, Mich., and Richard Chute, Birmingham, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 20, 1984, Ser. No. 602,338

Int. Cl.³ F16K *7/12, 31/02*

U.S. Cl. 137—625.28 **7 Claims**



1. A fast acting mechanical valve, comprising:

a first planar sheet-like electrically conductive film having an electrically insulative face surface on one side thereof, and an array of apertures through said film and face surface;

a second planar sheet-like electrically conductive film abutting said insulative face surface on the opposite side thereof from said first film, and having an array of apertures through said second film nonaligned with said first mentioned array; and

means for effecting relative movement between said films to open passages through said apertures allowing transverse fluid flow through said films, wherein said last mentioned means comprises electric circuit means for supplying electric current flow through said first and second films to effect relative transverse movement therebetween due to interacting electromagnetic fields.

4,538,643

ELECTROPNEUMATIC PILOT CONTROL STAGE FOR A PNEUMATIC SERVO VALVE

Wolf-Dieter Goedecke, Unterkirnach; Gerhard Schneckenburger, Hüfingen, and Reinhard Schwenzer, Aachen, all of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

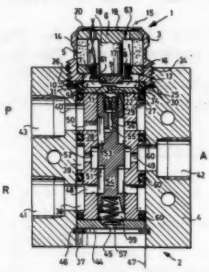
Filed Jun. 7, 1983, Ser. No. 501,986

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3221928

Int. Cl.³ F16K *31/12, 31/02*

U.S. Cl. 137—625.64 **9 Claims**

1. Electropneumatic pilot or anticipatory control stage for controlling a pneumatic servo valve for a pneumatic drive system comprising an axially extending housing having a first end and a second end spaced apart in the axial direction thereof, an annular plunger coil located in said housing adjacent the second end thereof, means in said housing adjacent the second end thereof including an impact plate for supporting said plunger coil, said plunger coil arranged to control said impact plate on the basis of the input of electrical signals, said annular plunger coil having an axis extending in the same general direction as the axis of said housing, said means forming a plurality of openings and including a coil body mounting said plunger coil, said coil body forming an opening therethrough in communication with the openings formed by said means, the openings in said means and in said coil body having axes extending in the axial direction of said housing, an axially extending annular magnet located within said housing spaced radially outwardly from said coil body and with the axis of said magnet extending in the same general direction as the axis of said housing and extending between said coil body and the first end of said housing, said magnet defining an inner axially extending hollow space, a T-shaped anchor including an axially extending anchor peg extending into said housing from the first end thereof, said anchor peg extending in the axial direction of said housing into said hollow space within said magnet, said anchor having a head located at one end of and extending transversely outwardly from said anchor peg, said head located at the first end of said housing, said peg being spaced



radially inwardly from said magnet forming an axially extending open annular space therebetween, said head of said anchor having exhaust ducts extending therethrough and communicating with said open annular space, said plunger coil and coil body positioned at the end of said annular open space more remote from the first end of said housing and spaced outwardly from said peg and inwardly from said magnet forming open spaces arranged around said plunger coil, the second end of said housing arranged to receive a flow of air forming the working medium of the servo valve passing through the openings in said means and said coil body and then through the open spaces about said plunger coil for cooling said coil and then through the open annular space to and out of said housing passing through said exhaust ducts.

4,538,644

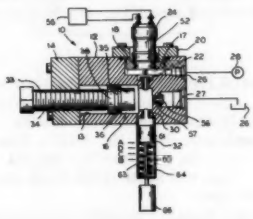
PRESSURE REGULATOR

Dale A. Knutson, Nashotah, and Frank Fritz, Milwaukee, both of Wis., assignors to Applied Power Inc., Milwaukee, Wis.

Filed Jun. 9, 1983, Ser. No. 502,699

Int. Cl.³ F15B *13/044;* **F17D** *1/20*

U.S. Cl. 137—625.64 **24 Claims**



1. A hydraulic pressure regulating device including means defining a chamber having an inlet and an outlet, an orifice disposed in said inlet and having a predetermined cross-sectional area for metering the flow of pressurized fluid relative to said chamber,

a source of hydraulic pressure coupled to said inlet,

electroresponsive regulating means having a plunger means oriented in an opposed relation relative to said orifice and adjacent thereto, operable to move said plunger

said regulating means being operable to move said plunger in a timed relation in response to each of a series of electrical pulse signals for movement from a first position relative to said orifice to a second position and for returning said plunger means to its first position upon cessation of each pulse signal for changing the effective flow area of said orifice whereby the pressure in said chamber varies with the integral of said signals, and

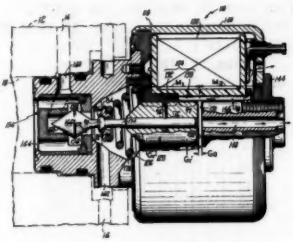
pressure responsive means communicating with said chamber and movable from a null position in response to changes in pressure within said chamber.

4,538,645

CONTROL VALVE ASSEMBLY

Asi Perach, Wheeling, Ill., assignor to Ambac Industries, Inc., Dearborn, Mich.

Filed Aug. 16, 1983, Ser. No. 523,909
Int. Cl.³ F16K *31/06*
U.S. Cl. 137—625.65 **17 Claims**



1. A control valve assembly of the type adapted to be operated at a high frequency with a variable duty cycle, the valve having an axis Am, which comprises:

a housing having a cavity which extends axially within the housing, the housing further having

a first seat disposed in the cavity,

a second seat disposed in the cavity and spaced axially from the first seat leaving a control chamber therebetween,

a first port which adapts the valve assembly to be in fluid communication with a fluid at a first pressure, and which is in fluid communication through one of said seats with the control chamber,

a second port which adapts the valve assembly to be in fluid communication with a region having a fluid at a second pressure which is not equal to the first pressure, and which is in fluid communication through the second seat with the control chamber,

a third port which is in fluid communication with the control chamber;

an integral armature extending axially about the axis Am which is movable in a first direction to a first position and movable in a second direction to a second position, the armature having

a poppet disposed in the control chamber which is adapted to engage the first seat at the first position of the armature and to engage the second seat at the second position of the armature,

a plunger disposed in the cavity which is spaced axially from the poppet and which is spaced radially from the housing leaving a clearance gap Gr therebetween, and having an end spaced axially from the housing leaving an axial gap therebetween,

a shaft which extends axially from the plunger to the poppet through one of said seats to join the poppet to the plunger;

a first means for urging the poppet in one of said directions to engage one of said seats; and

a coil extending circumferentially about at least a portion of the plunger for urging the poppet in the other of said directions to engage the other of said seats;

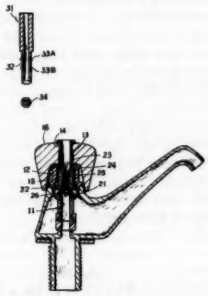
wherein forces exerted on the armature are transmitted to the poppet to move the poppet at high frequencies from the first seat to the second seat and from the second seat to the first seat to establish an average pressure in the control chamber which is a function of the time spent at each seat and between the seats, and wherein the inertia of the plunger acts to resist movement of the poppet in the radial direction in response to fluid forces acting on the poppet as the poppet moves between the seats.

4,538,646

FAUCET WITH BUILT-IN NEEDLE VALVE

Wen-Liang Yang, P.O. Box 10160, Taipei, Taiwan

Filed Mar. 20, 1984, Ser. No. 593,231
Int. Cl.³ F16K *31/58*
U.S. Cl. 137—883 **1 Claim**



1. A faucet with built-in needle valve comprising:

a hollow stem formed with a hollow stem tube with both ends opened;

a needle valve resiliently mounted in said hollow stem tube; and

a syringe movably inserted into said hollow stem tube above said needle valve;

the improvement which comprises:

said built-in needle valve resiliently mounted in said hollow stem tube of said hollow stem and including a needle rod, an extension tip formed on the uppermost end of said needle rod, a perforated spring retainer formed near the central portion of said needle rod and perforated with several holes thereon for water passage through said holes, a restoring spring backed by said spring retainer inserted into said hollow stem tube and a tapered rubber plug formed on the lowest end of said needle rod to seat tapered seat formed in said hollow stem tube; and

said syringe having a hollow adaptor movably inserted into said hollow stem tube and having a pressing plate which is a slim plate, centrally formed on the bottom of said syringe adaptor,

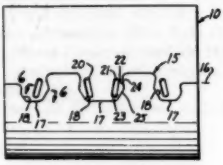
whereby when said syringe is inserted in said hollow stem to allow said pressing plate to ride atop said extension tip of said needle rod, the depression of said syringe will lower said tapered rubber plug to to allow the flow of water upwards through said hollow stem, the passage beside said pressing plate and said hollow adaptor for upwards rinsing use.

4,538,647

INTERLOCKED METAL SEAM STRUCTURE WITH IN-PLANE STABILIZATION

Phillip E. Saurenman, 3438 Vosburg St., and William A. Casler, 3487 Barbite St., both of Pasadena, Calif. 91107

Division of Ser. No. 256,718, Apr. 23, 1981, Pat. No. 4,383,354.
This application Mar. 16, 1983, Ser. No. 475,865
Int. Cl.[3] F16L 9/12
U.S. Cl. 138—166 4 Claims



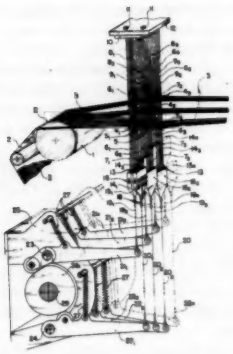
1. A metal cylindrical ring having an axis, an inside surface, and an outside surface, said ring having been formed from a strip having a tongue on one end of said strip and a recess on the other end of said strip, said tongue and recess being interlocked to form said ring with an in-plane seam, which seam comprises abutting edges of said tongue and recess, at least part of which are thrust into an interference with one another by movement of metal, at least one of said edges against the metal of the other said edge, said ring having in its surfaces the shapes resulting from the of an out-of-plane dimple which when initially formed had a closed perimeter in said surfaces, and within said perimeter a raised portion on one said surface, and a complementary indented portion in the other said surface, followed by the flattening of said dimple so that no portion of said dimple projects above either of said surface, said shapes lying close enough to said seam that said movement of metal to form said interference was formed at least in part by the flattening of said dimple.

4,538,648

HEALD CONTROL SYSTEM FOR A TRAVELLING WAVE SHEDDING LOOM

Luciano Corain, Vicenza, Italy, assignor to Nuovo Pignone S.p.A., Florence, Italy

Filed Oct. 24, 1983, Ser. No. 544,648
Claims priority, application Italy, Nov. 5, 1982, 24092 A/82
Int. Cl.[3] D03C 5/00
U.S. Cl. 139—79 5 Claims



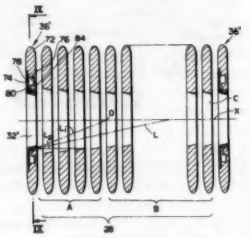
1. A heald control system for a multi-phase loom having at least two corresponding sets of healds which are moved vertically in mutual opposition, the healds of the two sets being divided into corresponding side-by-side successive sections which are each moved, mutually offset by a predetermined angle, by a cam-controlled operating lever, said heald control system comprises; a single support plate; a plurality of elastic traction elements connected between the upper portions of said healds and said support plate; a single connection block for each set of healds, the lower portions of said healds in a set being locked to each of said connection blocks; and a plurality of flexible elements for connecting each of said connection blocks to the end of a cam-controlled operating lever.

4,538,649

WEFT PICKING DEVICE OF AIR JET TYPE WEAVING LOOM

Yasushi Kobayashi, Kokubunji, and Hidetsugu Umezawa, Higashiyamoto, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 19, 1983, Ser. No. 562,730
Claims priority, application Japan, Dec. 22, 1982, 57-223877; Aug. 19, 1983, 58-150129
Int. Cl.[3] D03D 47/30
U.S. Cl. 139—435 20 Claims



1. A weft picking device of an air jet type weaving loom, having a plurality of air guide members which are aligned in the weft picking direction, each guide member having therein both a tapered air guide opening through which the weft yarn passes upon weft picking, and a slit through which the weft yarn passes out upon beating, the tapered surface of the air guide opening of each air guide member being tapered toward the weft picking direction, and wherein said plurality of air guide members comprises:

a nozzle-mounted air guide member having around the air guide opening thereof a plurality of air ejection holes from which compressed air is ejected in the weft picking direction to establish an auxiliary air flow;

a first group of air guide members located downstream of said nozzle-mounted air guide member and positioned between the nozzle-mounted air guide member and the point at which the inboard boundary of the auxiliary air flow from each air ejection hole intersects the axis of the air guide channel of the aligned air guide members, the air guide openings of the first group air guide members being larger than the air guide opening of said nozzle-mounted air guide member and gradually reduced in diameter as the distance from the nozzle-mounted air guide member increases; and

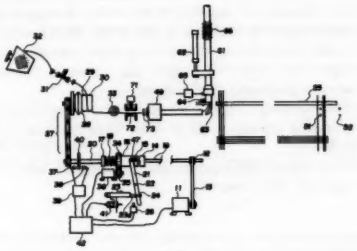
a second group of air guide members located downstream of said first group of air guide members, the air guide openings of said second group air guide members being identical to one another and to the air guide opening of said nozzle-mounted air guide member.

4,538,650

METHOD FOR PREPARING WEFT SUPPLY TO BE PICKED UPON STARTING THE OPERATION OF A WEAVING LOOM, AND AN APPARATUS FOR EFFECTING THE SAME

Ikuo Kodama, Toyota; Masaharu Inoue, Kariya; Masao Shiraki, Toyota, and Hajime Suzuki, Anjo, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 29, 1983, Ser. No. 555,954
Claims priority, application Japan, Dec. 9, 1982, 57-185325; Dec. 27, 1982, 57-227153
Int. Cl.³ D03D *47/36*
U.S. Cl. 139—452 21 Claims



1. A method for preparing a weft to be picked upon starting the operation of a weaving loom, said weaving loom comprising a means for driving said weaving loom, a means for measuring said weft to be picked by a picking means, a means for driving said weft measuring means, and an auxiliary means for driving said weft measuring means, said method comprising:

releasing a connection between said means for driving said weft measuring means and said weaving loom driving means so as to enable said auxiliary means to drive said means for driving said weft measuring means;

positioning said weft measuring means by means of said auxiliary means at a position suitable for being threaded with said weft;

threading said weft onto said weft measuring means; and

driving said weft measuring means by said auxiliary means so as to store a predetermined amount of weft thereon.

5. An apparatus for preparing a weft to be picked upon starting the operation of a weaving loom, said weaving loom comprising a means for driving said weaving loom, a means for measuring said weft to be picked by said picking means, a means for driving said weft measuring means, shiftable connection means normally engaging said weaving loom driving means and said means for driving said weft measuring means, and an auxiliary means for driving said weft measuring means, said apparatus further comprising:

a means for shifting said connection means from said weaving loom driving means to said auxiliary driving means whereby said auxiliary driving means drives said weft measuring means; and

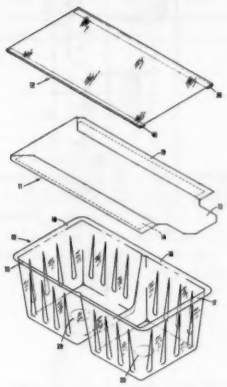
a means for positioning said weft measuring means at a position suitable for being threaded with said weft when said weft measuring means is driven by said auxiliary driving means, and for controlling said auxiliary driving means so as to store a predetermined amount of weft on said weft measuring means after threading said weft thereonto.

4,538,651

INTERLOCKED, CLEAN LOADING TONER CARTRIDGE

Larry W. Lykins, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 18, 1983, Ser. No. 514,997
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—1 13 Claims



1. A traveling-fold sealed toner cartridge selectively containing toner "A" or toner "B", for use with reproduction devices "A" or "B", respectively, comprising:

a cartridge housing having a first end wall and a second oppositely disposed end wall, having interlock means insuring use of the proper toner with the proper reproduction device such that said first end wall faces a given direction when toner "A" is mounted on reproduction device "A", and said second end wall faces said given direction when toner "B" is mounted on reproduction device "B", and having an opening through which toner exits the housing; and

a removable traveling-fold seal strip which includes a folded-back handle portion to facilitate removal of the seal strip, said seal strip being capable of closing said housing opening in one of two different 180° rotated positions relative said interlock means and said end walls, such that said handle portion is exposed for seal removal only when a toner "A" cartridge is mounted on reproduction device "A", and vice versa.

4,538,652

DEVICE FOR INCORPORATING A DOSE OF LIQUEUR IN A BOTTLE OF CHAMPAGNIZED WINE

Jean Valentin, Montmort; Patrick Suply, Epernay, and Stéphane Detrier, Fere en Tardenois, all of France, assignors to Etablissements F. Valentin, Epernay, France

Filed Jun. 7, 1983, Ser. No. 502,033
Claims priority, application France, Jun. 10, 1982, 82 10369
Int. Cl.³ B67C *3/08*
U.S. Cl. 141—57 7 Claims

1. A device for injecting a dose of liqueur into a bottle containing a liquid saturated with a gas, and for correcting the height of the liquid to a chosen level while maintaining the gas saturation of the liquid comprising:

(a) a gas-pressurized closed tank containing saturated liquid;

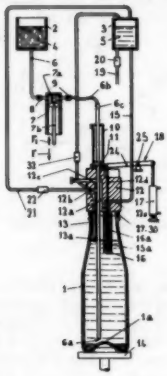
(b) a head operative to seal against the bottle above said chosen level;

(c) first pipe means connected from the tank through the head into the interior of the bottle and having first valve means operative to open the pipe means for selectively introducing liquid from the tank into the bottle;

(d) dose injection means including an injection tube extend-

ing through the head and having an open free end positioned to be located substantially at the bottom of the bottle;

(e) means for pressurizing the interior of said bottle to a pressure in excess of the pressure of the saturating gas in the bottle;



(f) means for delivering excess liquid from above the chosen level in the bottle into said closed tank when the interior of the bottle is pressurized at said excess pressure; and

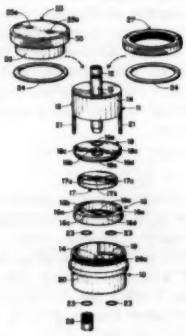
(g) means for selectively eliminating said excess pressure in the bottle.

4,538,653

CLOSURE AND VALVE FOR LIQUID CONTAINER

Gregory T. Shea, Westerville, and Ernest R. Ballantyne, Columbus, both of Ohio, assignors to Genoa Group Inc., Columbus, Ohio

Filed Dec. 4, 1984, Ser. No. 677,760
Int. Cl.³ F16K *5/00*
U.S. Cl. 141—285 **8 Claims**



1. A closure, filling and dispensing device for drums and other containers for liquids comprising

(a) a lower valve body consisting of a cylindrical housing with an inner wall,

(b) a rotatable upper plug body insertable into valve body (a) and having two channels therein and equipped with liquid and gas supply lines traversing the top of the plug body,

(c) a groove in the inside wall of valve body (a) or in the outside wall of plug body (b),

(d) a guide detent protruding from the inside wall of valve body (a) or from the outside wall of plug body (b) positioned to register with and pass through the groove (c) when the valve and plug bodies are assembled, to lock them together,

(e) two rotatable in-line discs positioned in said valve body, said discs having off-center fluid inlet and outlet openings and an axial hole, said plug body having at least one downwardly depending stem for rotating said in-line discs,

(f) a non-rotating disc, positioned in said valve body between said rotating discs, having an axial hole and off-center fluid inlet and outlet openings which will register with corresponding openings in the discs of (e),

(g) an axial splined shaft secured in the bottom of the valve body which non-engagedly traverses the axial holes in the rotating discs but engages the wall of the hole in the non-rotating disc,

(h) the rotating discs being notched on their edges to receive said depending stem to rotate the rotating discs but not the non-rotating disc when the plug body is rotated,

(i) the holes in the rotating discs always being in alignment with respect to each other and in alignment with the holes in the non-rotating disc during fluid transfer but in non-alignment therewith when the valve is closed during storage or transit of the drum,

(j) fluid inlet and outlet channels in the valve body (a) corresponding to and aligned with the channels in the plug body (b).

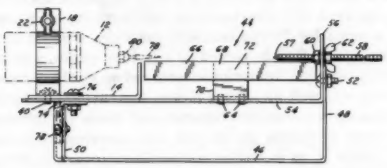
(k) and means for holding the valve body and plug body together after assembly.

4,538,654

MULTIPLE USE FIXTURE ASSEMBLIES FOR A CUTTING TOOL

Alex M. Nickoloff, 5383 E. Atherton Rd., Burton, Mich. 48519

Filed Jul. 6, 1984, Ser. No. 628,502
Int. Cl.³ B27C *9/00*
U.S. Cl. 144—1 F **17 Claims**



1. Multiple interchangeable part fixture assemblies to support a powered cutting tool in at least one of three or more selectable different cutting configurations, comprising,

two elongated substantially L-shaped frame members and a U-shaped frame member, said L and U-shaped members selectably attachable together to form a frame for at least one cutting configuration,

one of said L-shaped members separately usable as a frame for another cutting configuration,

clamp means attachable to at least one of the frame members to retain a powered cutting tool, and,

selectable locating means attachable to at least one of said frame members for locating a work piece relative to the powered cutting tool, said locating means selectable from a set substantially of standard hardware fittings.

4,538,655

CUTTER HEAD SYSTEM

James E. Berkeley, Englewood, Ohio, assignor to Shopsmith, Inc., Dayton, Ohio

Filed Jun. 25, 1984, Ser. No. 623,901
Int. Cl.³ B27G *13/00*; B27C *1/14*
U.S. Cl. 144—230 **13 Claims**

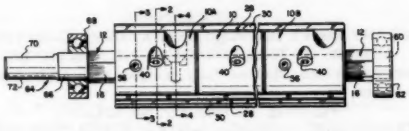
13. A cutter head system adaptable to a plurality of woodworking tools, comprising:

a plurality of elongate shafts, each having a different, prede-

termined length, a hexagonal shape in cross section and an end adapted to be attached to a driving coupling;

a plurality of cutter segments adapted to be mounted singly or in abutting relation on a selected one of said shafts, each of said segments having a generally cylindrical shape, a concentric bore having a hexagonal contour in cross section shaped to matingly receive a selected one of said shafts therethrough, thereby preventing rotation therebetween, and a plurality of longitudinally extending slot portions spaced evenly about an outer periphery of said segment and coextensive therewith, said slot portions oriented parallel to said bore and positioned on each side of said segments to form continuous slots extending substantially an entire collective length of said cutter segments, said collective lengths of combinations of said cutter segments corresponding to said lengths of said shafts;

a plurality of sets of blade members, each of said sets corresponding in length to a combined length of a selected number of said segments, each blade element tapering in



thickness from a base to a cutting edge thereof and sized to fit within and extend substantially an entire length of one of said slots;

a plurality of sets of wedge plates, each of said wedge plate sets corresponding in length to one of said blade sets, each of said wedge plates of a selected set positioned within and extending substantially an entire length of one of said slots, and including a subsantially flat head portion abutting an adjacent one of said blade members along a side thereof, and a foot raised from said head portion and extending along a lower edge thereof;

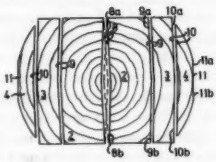
a plurality of set screws threaded through said segments and having ends projecting into said slots above said lip portions such that said screws may be advanced toward said wedge plates to urge said wedge plates to clamp said blade members against said cutter segments, and said foot portions engage said screw ends to prevent removal of said blade members and said wedge plates from said slots should said screws become loosened from said wedge plates yet still project a predetermined distance into said slots.

4,538,656

METHOD FOR SAWING A LOG OR A BLOCK INTO PIECES OF LUMBER

Per M. Wiklund, Täby, Sweden, assignor to Trateknik Centrum, Stockholm, Sweden

Filed Dec. 6, 1983, Ser. No. 558,515
Claims priority, application Sweden, Dec. 27, 1982, 8207411
Int. Cl.³ B27B *1/00*; B27C *9/04*
U.S. Cl. 144—378 **8 Claims**



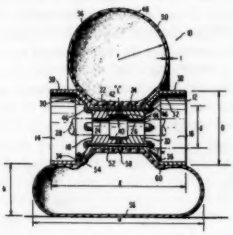
1. Method for sawing a log into pieces of lumber, comprising sawing a log lengthwise to produce pieces of lumber having longitudinal cut surfaces, such that, in a cross section of the log, the lateral surface of each of said pieces of lumber facing the center of the log is substantially concave and the lateral surface of each of said pieces facing away from the center of the log is substantially convex, and adapting the degree of concavity and convexity to the local tangential and radial shrinkage properties of the wood so that, after drying said sawn out pieces of lumber to the desired moisture ratio, said cut surfaces of said pieces are substantially planar and parallel.

4,538,657

WHEEL FOR LAND VEHICLES AND METHOD FOR MOVING SUCH VEHICLES OVER SOFT OR IRREGULAR SURFACES

William E. Tuggle, 212 65th St., Virginia Beach, Va. 23451

Filed Feb. 16, 1983, Ser. No. 467,051
Int. Cl.³ B60C *5/12*; B60B *5/02, 3/08*
U.S. Cl. 152—375 **14 Claims**



4. An improved tire-rim combination for land vehicles intended to be operated on soft support surfaces such as beach sand or on irregular support surfaces such as rocky terrain, said combination comprising:

a low pressure tire for engaging a tire supporting rim, said tire comprising a thin-walled torus-like body of elastomeric material wherein the wall of said tire located adjacent to the said soft support surfaces or said irregular support surfaces is at least substantially free from reinforcing fabrics or cords, said body having an inner diameter surface for engaging such a rim, said tire further comprising means for inflating said body to a low pressure configuration and an outer diameter surface for contacting said soft or irregular support surfaces; said elastomeric material of said thin-walled body having such elasticity and flexibility and said low pressure being up to 10 psi and being such that when said body is mounted on such a rim, is inflated to said low pressure and is subjected to an axle load, said tire flexes to flatten substantially from its unloaded configuration and continues to flatten as said load is increased, so that said tire provides an enlarging contact area between said outer diameter surface and said soft surfaces as said load is increased whereby rolling friction is reduced between said tire and said soft surface, and said tire also stretches to deform substantially when said tire encounters an obstacle when said load is applied, whereby bouncing of said tire is reduced; and

a tire supporting rim having a substantially cylindrical outer surface engaging said inner diameter surface of said tire and a central opening for engaging an axle; and

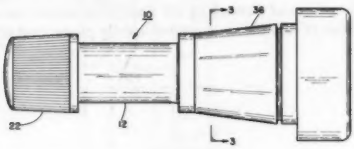
wherein said rim comprises a pair of oppositely, axially extending support flange means for engaging said tire on either side as said tire deforms or flattens.

4,538,658

TIRE VALVE ASSEMBLY

John R. Earley, Lynchburg, Va., assignor to Bridge Products, Inc., Northbrook, Ill.

Filed Jan. 17, 1983, Ser. No. 458,513
Int. Cl.³ B60C *23/10*
U.S. Cl. 152—427 **7 Claims**



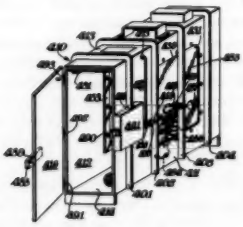
1. A tubeless tire valve assembly for mounting within an aperture in a tire rim for a tubeless tire, said valve assembly comprising an elongated generally cylindrical valve stem of rigid material having a first substantially radial annular flange portion proximate one end defined by a pair of annular surfaces lying in substantially parallel spaced planes disposed substantially perpendicular to the longitudinal axies of said valve stem, said valve stem having a reduced diameter outer surface portion said first flange portion, said valve stem further defining an internal thread proximate the end thereof opposite said one end for threadingly receiving a valve core having a mating external thread, and a generally tubular rubber body molded about said valve stem and said first flange portion so as to be adhered to said pair of said annular flange surfaces and at least a portion of the length of said valve stem extending from said flange portion toward said opposite end and including said reduced diameter outer surface portion, said rubber body being operative to trap said valve stem within said rubber body and having at least one exterior annular recess formed therein intermediate said first annular flange portion of said valve stem and said opposite end thereof, said annular recess being adapted for sealing contact with the surface of a tire rim with said first annular flange disposed on the internal side of the tire rim, said first annular flange having a diameter approximately equal to the diameter of the portion of said rubber body received through the tire rim aperture so as to substantially prevent the tubeless tire valve from being blown out of the rim aperture.

4,538,659

SAFE TIRE INFLATOR

Robert W. Adelman, and Daniel W. Blevins, both of New Castle County, Del., assignors to The Crowell Corporation, Newport, Del.

Continuation of Ser. No. 355,876, Mar. 8, 1982, abandoned, and a continuation-in-part of Ser. No. 287,556, Jul. 28, 1981, abandoned, and a continuation-in-part of Ser. No. 264,196, May 15, 1981, Pat. No. 4,410,021. This application Mar. 7, 1983, Ser. No. 472,860
Int. Cl.³ B60C *29/00*
U.S. Cl. 157—1 **1 Claim**



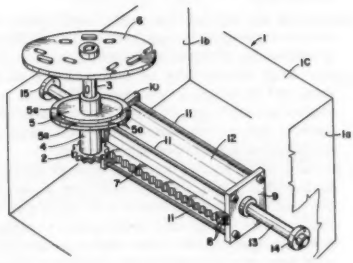
1. A rugged enclosure for tire inflation having opposing side walls connected by top, bottom and end walls shaped and dimensioned to receive a tire-and-wheel assembly, the walls being steel plate, steel reinforcing members welded on completely across the outer surfaces of the side walls to make the enclosure highly resistant to inflation accidents, viewing windows cut in the side walls to permit close observation of the tire-and-wheel assembly, transparent panels fitted in the viewing windows and sufficiently thick to withstand inflation accidents, inflating controls are fitted on the outer surfaces of the side walls, and an inflation conduit extends from those inflating controls through an opening in an adjacent transparent panel to a tire valve connector line inside the enclosure, that line being self-coiling and located so that it is out of the way in the event of a wheel failure.

4,538,660

ROTARY DRIVE DEVICE FOR MANDREL-CARRYING ARBORS OF TIRE DISMOUNTING MACHINES

Boccaletti Franco, Modena, Italy, assignor to F.A.I.P. S.p.A., Modena, Italy

Filed Aug. 18, 1983, Ser. No. 524,509
Claims priority, application Italy, Sep. 6, 1982, 29043/82[U]
Int. Cl.³ B60C *25/00*
U.S. Cl. 157—20 **1 Claim**



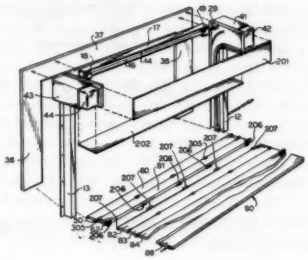
1. In a tire dismounting machine including a housing, a rotatable mandrel outside said housing to support the rim of a tire to be dismounted, said housing including a pair of horizontally spaced apart vertical end walls, arbor means for rotating said mandrel, means supporting said arbor means on said housing for rotation relative thereto about a vertical axis between said end walls, pinion means on said arbor means, rack means horizontally reciprocable in the direction between said end walls and drivingly engaging said pinion means, and hydraulic piston and cylinder means to reciprocate said rack means relative to said pinion means, the improvement comprising: said piston and cylinder means including a cylinder member laterally outwardly of said arbor means and having opposite ends in the direction between said end walls, said opposite ends of said cylinder member being on opposite sides of said vertical axis with respect to said direction, said piston and cylinder means further including a piston rod reciprocably supporting said cylinder member and having longitudinally opposite ends each spaced outwardly from a corresponding one of the opposite ends of said cylinder member and fixedly secured to a corresponding one of said end walls of said housing, and said rack means having opposite ends fixedly secured to said opposite ends of said cylinder member for displacement of said cylinder member in opposite directions along said piston rod to displace said rack means therewith to rotate said pinion means.

4,538,661

GARAGE DOOR OPERATOR AND METHOD OF ASSEMBLING

Susanne G. Henry; Kazuo Tsunemura, both of Chicago, and Kiyoshi Iha, Elk Grove Village, all of Ill., assignors to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed Aug. 9, 1983, Ser. No. 521,752
Int. Cl.[3] E06B 9/32; E05F 15/00
U.S. Cl. 160—35 **11 Claims**



1. A garage door and opener formed in modular units formed for mounting over an opening comprising, a pair of side drive frame assemblies including door supporting rails and driving means mounted therein, a spreader frame unit in which a drive shaft is rotatably mounted which is detachably connected to said door driving means mounted in said pair of side drive frame assemblies, a drive means mounted in one of said drive frame assemblies and coupled to said drive shaft to move said door driving means, means for connecting said pair of side drive frame assemblies and said spreader frame unit about said opening, and a door mounted in said supporting rails of said pair of side drive frame assemblies and connected to said door driving means, and wherein said door driving means in each of said pair of side frame assemblies include stub shafts which are detachably connectible to opposite ends of said drive shaft.

4,538,662

WINDOW HAVING DOUBLE-GLAZED SLIDING DOORS AND BLINDS

Katsuaki Tomita, Matsudo, Japan, assignor to Tachikawa Corporation, Tokyo, Japan

Filed Sep. 12, 1983, Ser. No. 531,050
Int. Cl.[3] E05C 7/02; E06B 3/46
U.S. Cl. 160—107 **5 Claims**

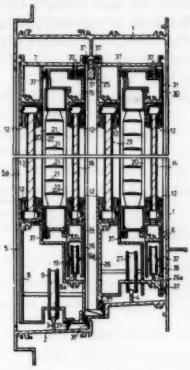
5. A window having double-glazed sliding doors and blinds, the window comprising:

glazed exterior assemblies and interior assemblies supported on the lower frame of the sash of said window;

lower frames installed in said exterior and interior assemblies so as to permit said assemblies to move longitudinally;

blinds mounted between one of said exterior assemblies and an associated one of said interior assemblies; and

supporting means disposed in the open lower end portion of the one vertical frame of the interior assemblies mounted



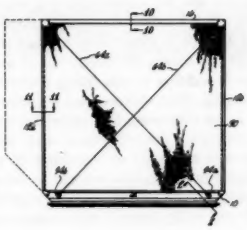
on said lower frames, the supporting means being mounted on the lower frame of said sash.

4,538,663

CARGO CONTAINER

Robert Looker, 405 Toro Canyon Rd., Carpinteria, Calif. 93013

Continuation-in-part of Ser. No. 487,274, Apr. 21, 1983, abandoned. This application Apr. 12, 1984, Ser. No. 598,407
Int. Cl.[3] A47H 3/00
U.S. Cl. 160—368 R **6 Claims**



1. In a cargo container having a base, corner posts extending upwardly therefrom, cross pieces between the corner post and side sheets attached to the corner posts, base and crosspieces to define a box-like container having one or more door openings, a tensionable sealing and load supporting fabric door closure apparatus for each door opening comprising:

(a) a piece of fabric material attached at its first end to the crosspiece above the door opening;

(b) an elongate bar attached to the second end of said piece of fabric material;

(c) pin means attached to said elongate bar for engaging hook means attached to the cargo container on either side of the door opening; and

(d) cable means for sealing and tensioning the cargo container, said cable means attached at either end of said elongate bar at a point below said pin means and extending up and attached to the edges of said piece of fabric material and to the top of the corner posts on either side of the door opening such that when said pin means engages said hook means, and said elongate bar is brought flush against the door opening, said cables are pulled taut.

4,538,664

PROCESS AND APPARATUS FOR COMPACTING MOLD MATERIAL

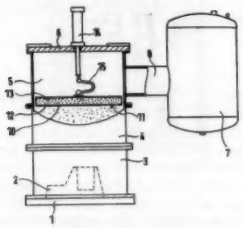
Alfons Köbel, Karlsruhe, and Norbert Damm, Karlsdorf-Neuthard, both of Fed. Rep. of Germany, assignors to BMD Badische Maschinenfabrik Durlach GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 16, 1983, Ser. No. 475,725

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210504

Int. Cl.³ B22C *15/00*

U.S. Cl. 164—37 **8 Claims**



1. A process for compacting foundry mold making material by gas pressure compaction comprising heaping foundry mold making material onto a pattern, placing a further, gas-permeable mass all over a top, otherwise free surface of said material, said further, gas-permeable mass being made up of a number of separate masses able to be moved in a direction normal to the said top surface of the material, causing a gas pressure to take effect on the said surface to compact said mold making material and removing said further, gas-permeable mass from said compacted mold making material.

4. An apparatus for the compaction of a mold, comprising a flask, a pattern plate walling in one side of said flask, a filling frame walling in a space joined with a space within said flask, a high gas pressure means for supplying of gas under a high pressure to mold material in said filling frame for producing a violent compacting effect thereon, and a further mass designed to be placed on an otherwise free upper surface of said mold material for completely covering same, said further mass being gas-permeable and made up of a number of separate masses able to be moved in a direction normal to the said upper surface of the mold material, and said further mass being able to be lifted clear of said mold material after compaction thereof.

4,538,665

MOLDING BOX APPARATUS

Nagato Uzaki, Toyohashi; Toshihisa Komori, Okazaki; Kazuharu Matui, and Shigehiro Toyoda, both of Toyokawa, all of Japan, assignors to Sintokogio Ltd., Nagoya, Japan

Filed Mar. 9, 1983, Ser. No. 473,615

Int. Cl.³ B22C *9/12, 9/20, 15/22*

U.S. Cl. 164—160.1 **6 Claims**

1. A molding box apparatus comprising:

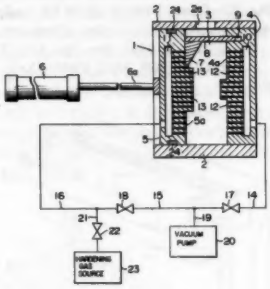
a horizontal tubular body provided in the center of upper wall thereof with a molding sand charging port;

a pair of pattern plates opposing to each other and fitting in said tubular body at both sides of said sand charging port, each of said pattern plates having a pattern surface of a configuration complementary to a part of a mold chamber to be formed;

a well pattern placed on one of said pattern plates;

a runner pattern of a length greater than the width of a mold chamber to be formed disposed in contact with said well pattern and extending from an end surface of said well pattern substantially perpendicularly to said pattern surface;

a guide hole formed in the other pattern plate and adapted to slidingly receive the end of said runner pattern; and



means for slidingly driving at least one of said pattern plates in said tubular body.

4,538,666

GAS VENTING ARRANGEMENT INCORPORATED INTO A MOLD

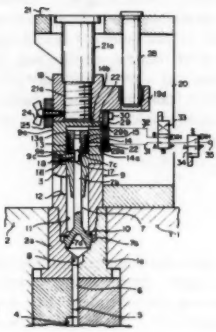
Takahiko Takeshima; Haruo Akemoto, and Hideki Iwai, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Nov. 8, 1983, Ser. No. 549,822

Claims priority, application Japan, Nov. 9, 1982, 57-195319

Int. Cl.³ B22D *17/20*

U.S. Cl. 164—305 **11 Claims**



1. In a gas venting arrangement incorporated into a mold formed of stationary and movable mold halves together defining a cavity to be filled with a melt, said gas venting arrangement comprising:

(a) a valve chamber including an enlarged forward portion formed in said mold and a constricted rear portion formed in a member separate from said mold, and a valve seat formed between said forward and rear portions;

(b) a gas vent passage formed in said mold connected to said cavity and to the forward end of said forward portion of said valve chamber;

(c) a gas discharge passage formed in said mold and opening on an inner side surface of said rear portion of said valve chamber to communicate with the outside of said mold;

(d) at least one by-pass passage formed in said mold branching from a point on said gas vent passage to an opening on an inner side surface of said forward portion of said valve chamber;

(e) a valve slidably received in said forward portion of said valve chamber for movement between a first position,

wherein said valve cooperates with said valve chamber to prevent said gas vent passage from communicating with said gas discharge passage through said forward portion of said valve chamber and to permit said by-pass passage to communicate therewith through said valve chamber, and a second position, wherein said valve rests against said valve seat and cooperates with said valve chamber to prevent both said by-pass passage and said gas vent passage from communicating with said gas discharge passage through said valve chamber;

(f) first means for biasing said valve into said first position and permitting movement of said valve into said second position under axial impingement against said valve of a portion of said melt injected into said cavity and forced to flow through said gas vent passage into said forward portion of said valve chamber, said first biasing means being adjusted and said by-pass passage being dimensioned and configured to permit movement of said valve into said second position before a second portion of said melt reaches said forward portion of said valve chamber through said by-pass passage;

(g) second means for biasing said valve into said second position after said valve is forced to move from said first position to said second position by an initial impingement of said melt; and

(h) first means for releasing said valve from said second biasing means to return from said second position to said first position, the improvement consisting in that:

(A) said gas venting arrangement comprises a pneumatic piston-cylinder device in such arrangement that said rear portion of said valve chamber has a closed rear end and extends rearward to form said cylinder at its rear end portion, and said valve has a rearward extension co-axially therewith and extending slidably thereinto, said valve extension forming said piston at its rear end portion;

(B) said first biasing means is that for releasably securing said valve in said first position to said rear portion of said valve chamber against the force of said second biasing means;

(C) said second biasing means is that for constantly urging said piston rearward relative to said rear portion of said valve chamber;

(D) said piston-cylinder device functions as said first releasing means in such manner that said device actuates said piston to move forward against the force of said second biasing means; and

(E) said piston-cylinder device further functions as second means for releasing said valve from said first biasing means to move from said first position to said second position in such manner that said device actuates said piston to move rearward against the force of said first biasing means.

4,538,667

MOLDS FOR CONTINUOUSLY CASTING STEEL

Senri Hara, Ibaragi; Hiroshi Tomono, Osaka; Tomohiko Kimura, Fukuoka; Kunio Inoue, Takarazuka; Takayuki Sato, Osaka, and Yoshio Okada, Takarazuka, all of Japan, assignors to Sumitomo Metal Industries, Ltd. and Satosen Co., Ltd., both of Osaka, Japan

Continuation of Ser. No. 372,295, Apr. 27, 1984, abandoned. This application Sep. 7, 1984, Ser. No. 648,606

Claims priority, application Japan, Apr. 27, 1981, 56-64557; Aug. 3, 1981, 56-122202

Int. Cl.³ B22D *11/00*

U.S. Cl. 164—418 **20 Claims**

16. A mold of copper or copper alloy for continuously casting steel made by the method comprising

providing a roughened initial surface of a copper or copper alloy mold,

plating a first coating of nickel, cobalt or alloy thereof over the roughened initial surface,

plating a second coating of an alloy selected from the group consisting of alloys of

(a) 3 to 20% by weight phosphorous and, as the balance, nickel,

(b) 3 to 20% by weight phosphorous and, as the balance, cobalt,

(c) 3 to 20% by weight phosphorous and, as the balance, nickel and cobalt,

(d) 2 to 15% by weight boron and, as the balance, nickel,

(e) 2 to 15% by weight boron and, as the balance, cobalt,

(f) 2 to 15% by weight boron and, as the balance, nickel and cobalt,

(g) 3 to 20% by weight phosphorous, 2 to 15% by weight boron and, as the balance, nickel,

(h) 3 to 20% by weight phosphorous, 2 to 15% by weight boron and, as the balance, cobalt, and

(i) 3 to 20% by weight phosphorous, 2 to 15% by weight boron and, as the balance, nickel and cobalt, over the first coating, and

oxidizing an uppermost layer of the second coating to form an oxidized layer,

whereby a mold is formed having a rough inner surface corresponding to the roughness of said initial surface.

4,538,668

ASSEMBLY ROLL FOR HIGH TEMPERATURE SERVICE

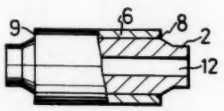
Hisakatsu Nishihara, Hirakata, and Arata Yoshimitsu, Katano, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 250,551, Apr. 3, 1981, abandoned. This application Mar. 28, 1984, Ser. No. 594,417

Claims priority, application Japan, Apr. 23, 1980, 55-55241

Int. Cl.³ B22D *11/128*

U.S. Cl. 164—448 **8 Claims**



1. A roll for high temperature service having a sleeve shrinkage-fitted onto a roll shaft under tight contact state, characterized by the sleeve having a composition expressed in % by weight

C: 0.06 to 0.2

Si: 0.1 to 2.0

Mn: 0.1 to 2.0

Cr: 10 to 14

N: 0.02 to 0.20

Fe: balance; and

C+N: 0.08 to 0.35.

4,538,669

DISTORTION MEASUREMENT IN CASTING

Kegham M. Markarian, Woodmere, and Robert Sobolewski, Streetsboro, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 297,958, Aug. 31, 1981, abandoned. This application Dec. 29, 1983, Ser. No. 565,841

Int. Cl.³ B22D *11/16*

U.S. Cl. 164—451 **13 Claims**

1. A method for continuously monitoring cross-sectional distortion in a relatively rigid hot cast metal product movable along a path and having ideally a predetermined rectangular cross-section, the product being subject during motion along the path to wavering movement transverse to the path, said method comprising the steps of:

(a) supporting first and second contact elements transversely displaced from said path for independent movement toward and away from said workpiece path and oriented to face inwardly toward diagonally opposed dihedral edges of a cast product moving along the path;

(b) biasing the contact elements against respective edges of the cast product, without appreciably thereby changing workpiece temperature, the edges being defined by dihe-

dral angle intersections between exterior surfaces of the cast product, said biasing being of a force sufficient to facilitate continuous riding of the contact elements on the edges of the product while nonetheless limiting biasing force to a level sufficiently low to avoid any substantial alteration of the cross-sectional shape of the cast product due to impingement of the contact elements;

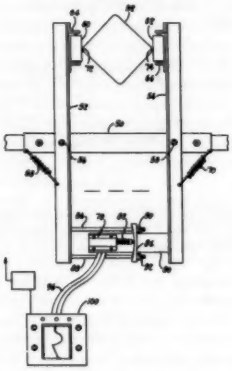
(c) producing by the use of a single transducer a single electrical signal representing the spacing between the contact elements for indicating distortion of the cross-sectional shape of the cast product independently of both absolute thickness dimension of the product, and of said wavering, and

(d) indicating when said electrical signal deviates outside a predetermined range.

9. A casting system comprising:

(a) a vertical mold adapted for accommodating molten metal for passage downwardly through the mold and casting it into a predetermined shape, said mold having a rectangular cross-sectional configuration defining the peripheral shape of the product to be cast, the location and orientation of said mold also defining a downwardly extending workpiece flow path along which the cast product passes subsequent to emergence from the mold, the cast product being subject during motion downwardly along the path, to wavering movement transverse to the path;

(b) support structure fixed to relative to the path;



(c) first and second guide arms movably mounted to said support structure, each arm extending on a different side of the path;

(d) first and second contact elements connected respectively to said first and second arms and oriented to face inwardly toward diagonally opposed dihedral edges of the cast product moving along the path said contact elements having a contact area which is small relative to the area of a side portion of the workpiece;

(e) means coupled to the guide arms for biasing the contact elements against said diagonally opposed edges of said cast product, said edges being defined by dihedral angle intersections between exterior surfaces of said cast product, said bias means applying a biasing force sufficient to facilitate continuous riding of the contact elements on said edges of the cast product while limiting biasing force to a level sufficiently low to avoid any substantial alteration of the cross-sectional shape of the cast product due to impingement of the contact elements, said bias means, guide arms and support structure cooperating to facilitate said contact elements to move independently transversely to said path to track wavering motion of the cast product in response to said wavering motion;

(f) a single transducer simultaneously coupled between said guide arms for producing an electrical signal representing the spacing between the contact elements, said electrical signal indicating distortion of said cross-sectional shape of said cast product independently of absolute thickness dimension of the product, and of said wavering motion and

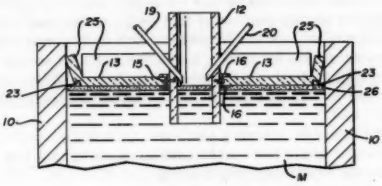
(g) means responsive to said electrical signal for indicating when said electrical signal deviates outside a predetermined range.

4,538,670

METHOD AND APPARATUS FOR POURING MOLTEN METAL IN A NEUTRAL ATMOSPHERE

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Feb. 6, 1984, Ser. No. 562,831
Int. Cl.³ B22D *11/10*
U.S. Cl. 164—475 **15 Claims**



1. The combination of a molten metal receiving vessel having substantially vertically standing walls and means for closing said vessel to the atmosphere and directing molten metal into said closed vessel; said means including a horizontally disposed closure formed of low thermal conductivity refractory material having an opening therein, a heat resistant sleeve in said opening having an upper end above and a lower end below said closure, said upper end positioned for registry with a nozzle of a ladle, a heat resistant deformable air lock gasket engaging said upper end of said sleeve and said nozzle, said closure having score lines to enable said closure to be movable from a first position on the lip portion of said vessel to a second position in said vessel engaging molten metal therein and arranged to float on said molten metal when the level of said molten metal falls below said second position.

13. The method of pouring molten steel into a tundish on a continuous caster in an oxygen free atmosphere comprising the steps of sequentially; placing a flat closure on said tundish in air sealing relation thereto; placing a sleeve in an opening in said closure in sealing relation thereto with part of said sleeve above said closure and part of said sleeve below said closure; placing a known quantity of hexamethylene in said tundish; engaging the nozzle of a ladle in sealing relation in said sleeve; pouring molten steel through the nozzle of the ladle through said sleeve and into said tundish so as to vaporize said hexamethylene to fill said tundish and expel atmospheric air therefrom; pouring molten steel through said nozzle and sleeve to fill said tundish with said molten steel to a level submerging at least a portion of said sleeve; moving said closure and sleeve into said tundish to rest on said molten steel.

4,538,671

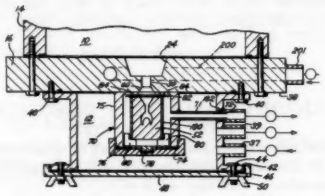
ARC FURNACE FOR THE PRODUCTION OF SMALL INVESTMENT CASTINGS OF REACTIVE OR REFRACTORY METALS SUCH AS TITANIUM

Richard M. Waterstrat, Gaithersburg, Md., assignor to American Dental Association Health Foundation, Washington, D.C.

Continuation-in-part of Ser. No. 258,673, Apr. 29, 1981,. This application Feb. 7, 1984, Ser. No. 577,855
Int. Cl.³ B22D *23/00*
U.S. Cl. 164—514 **3 Claims**

1. An improved arc furnace and investment casting apparatus comprising, in combination:

(a) an arc furnace, vacuum sealed melting chamber for maintaining a vacuum or inert gas including a cooled inert material bottom enclosure wall as an anode, a metal crucible formed in the cooled inert bottom wall, the crucible positioned substantially at the middle of the bottom wall;
(b) a non-consumable cathode projecting into the melting chamber over the inert crucible;
(c) means for providing power to the cathode and the anode to melt the crucible contents;
(d) a passage through the bottom wall from the inert crucible, the passage including a meltable foil valve;
(e) a first vacuum sealed casting chamber suspended from the bottom wall beneath the crucible passage, the casting



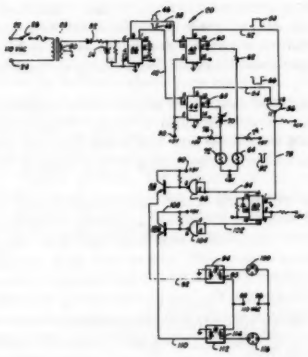
chamber including a removable bottom cover for access to the interior of the casting chamber;
(f) a second vacuum sealed casting chamber suspended from the bottom wall beneath the crucible passage, the second casting chamber being located within the first casting chamber and including a removable bottom cover for access to the interior of the casting chamber;
(g) a removable hot mold assembly within the second casting chamber including a sprue in communication with the crucible passage;
(h) means for evacuating each chamber; and
(i) means for purging the melting chamber and the first casting chamber with inert gas.

4,538,672

TRACKING TEMPERATURE CONTROLLER APPARATUS

Raymond C. Overton, and Charles F. Cole, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jul. 2, 1982, Ser. No. 394,675
Int. Cl.³ G05D *23/24*
U.S. Cl. 165—27 **8 Claims**



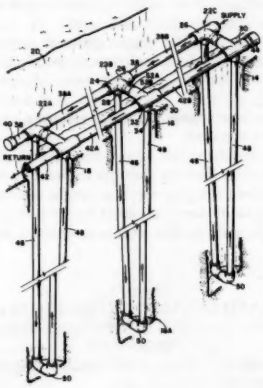
1. Temperature control apparatus, comprising:
clock means generating first and second clock pulses simultaneously in opposite polarity;
first means including a first thermistor, triggered by said first clock pulse and generating a first pulse output with duration controlled by said first thermistor;
second means including a second thermistor, triggered by said second clock pulse and generating a second pulse output with duration controlled by said second thermistor;
gate means receiving input of said first and second pulse outputs to generate a control pulse output having a duration equal to any difference between terminations of said first and second pulses;
control means energized by said control pulse output to generate a heating pulse output for the duration, and de-energized to generate an alternate cooling pulse when there is no control pulse output; and
heating and cooling means responsive respectively to said heating and cooling pulse outputs.

4,538,673

DRILLED WELL SERIES AND PARALLELED HEAT EXCHANGE SYSTEMS

James R. Partin, and John P. Rawlings, both of Stillwater, Okla., assignors to Geo-Systems, Inc., Stillwater, Okla.

Filed May 2, 1984, Ser. No. 606,177
Int. Cl.³ F28D *21/00*; F25D *23/12*
U.S. Cl. 165—45 **16 Claims**



1. A system for exchanging thermal energy between a fluid medium and the earth comprising:
a plurality of boreholes drilled in the earth at spaced apart but adjacent locations;
a header positioned above each borehole, each header having a supply inlet, a return outlet, a borehole inlet and a borehole outlet, said supply inlet communicating with said borehole inlet and said return outlet communicating with said borehole outlet, a partition within said header separating said supply inlet from said return outlet, said partition having means for the passage of air while at least substantially prohibiting the passage of fluid therepast;
a down pipe connected at its upper end to said borehole outlet of each said header and extending into said borehole therebelow;
an up pipe connected at its upper end to said header borehole inlet and extending into said borehole therebelow, the lower end of said down pipe and up pipe being connected to each other adjacent the borehole bottom; and
conduit means connecting said supply inlets and return outlets of said headers for conveyance of fluid through said down pipes and up pipes for transfer of thermal energy of fluid with the earth surrounding said boreholes.

4,538,674

HEAT EXCHANGER HAVING TUBULAR MEMBERS CONCENTRIC WITH FLUID CARRYING TUBES TO PREVENT MIXING OF THE HEAT EXCHANGE FLUIDS AND METHOD OF CONSTRUCTION THEREOF

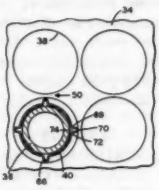
Donald C. Schluderberg, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 22, 1982, Ser. No. 421,551

Claims priority, application Australia, July 16, 1982, PCT/US 82/00960

Int. Cl.³ F28F *11/00*

U.S. Cl. 165—70 **4 Claims**



1. A method for constructing an heat exchanger comprising:

a. fabricating a tubular member which has at least one radially outwardly projecting portion which extends longitudinally of the tubular member to provide flexibility to the tubular member for expanding thereof radially outwardly to insert a tube therethrough;

b. sealingly attaching the tubular member within a shell to prevent entry of a first fluid flowing between an inlet and outlet of the shell to the space bounded by the tubular member;

c. flexing the tubular member while inserting a tube through the tubular member;

d. sealingly attaching the tube within the shell to prevent entry of a fluid flowing through the tube to the resulting space between the tube and the tubular member; and

e. assembling an inlet and an outlet for flow of a second fluid through the tube in heat exchange relation with the first fluid.

4,538,675

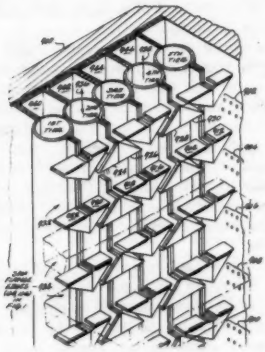
RETENTION AND COOLING OF PLUG-IN ELECTRONIC MODULES IN A HIGH SHOCK AND VIBRATION ENVIRONMENT

James W. Welsh, San Diego, Calif., assignor to Planning Research Corporation, McLean, Va.

Filed Apr. 1, 1982, Ser. No. 364,452

Int. Cl.³ F28F *7/00*

U.S. Cl. 165—80 C **40 Claims**



1. Apparatus for selectively clamping the edges of an array of plural electronic modules into mechanical and thermal contact with a fluid coolant circuit, said apparatus comprising:

a stack of plural substantially parallel generally planar fluid conduit-containing structures having spaced-apart parallel legs for jointly and transversely receiving a stack of plural generally planar electronic modules therewithin;

each said structure having mechanical/thermal contact pads disposed approximately perpendicular to its general plane on the inside edges of said parallel legs;

said contact pads being directed in one direction on some of said structures and in an opposite direction on others of said structures, and

means for moving at least said some structures to selectively clamp the edges of said stack of electronic modules between said opposingly directed contact pads.

4,538,676

GAS LIQUID PARALLEL FLOW DIRECT CURRENT HEAT EXCHANGER

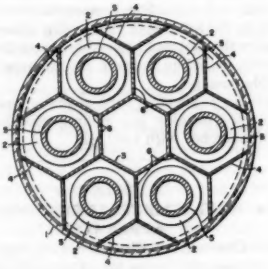
Ulrich Premel, and Jörgen Becker, both of Gummersbach, Fed. Rep. of Germany, assignors to L & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Feb. 23, 1933, Ser. No. 468,942

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206512

Int. Cl.³ F28D *7/12*

U.S. Cl. 165—145 **4 Claims**



1. A gas/liquid, parallel flow direct current heat exchanger in a waste-heat tank which is constructed as a pressure tank having a longitudinal axis, is charged with coolant, and is connected after a pressure gasification, said waste-heat tank being provided with an inner container wall; said heat exchanger with which a natural circulation exists rather than requiring any positive circulation comprising in combination therewith:

a central, polygonal first sealed displacement body without any medium flow therethrough which is coaxially disposed in said waste-heat tank and which has sides parallel to said axis, said sides intersecting to form corners of sides thereof;

first wall units connected to said inner container wall of said waste-heat tank and projecting angularly therefrom into the interior of said waste-heat tank; said first wall units being located substantially across said tank, projecting from the corners of the sides of said polygonal first displacement body; said first wall units serving to divide the interior of said waste-heat tank into regions, alternate ones of which provide means for upwardly and downwardly directed fluid flow;

cylindrical second displacement bodies having axes and disposed within said region centrally circumferentially between next adjacent corners of the sides of said polygonal first displacement body at predetermined locations radially outwardly thereof and spaced with axes thereof parallel to the longitudinal axis equidistantly therefrom

and intermediate said polygonal first displacement body and said inner container wall; and

elements equal in length relative to each other which serve as heat transfer surfaces and are respectively arranged coaxially about each of said second displacement bodies; with the number of sides of said polygonal first displacement body equal to the number of said heat transfer surface elements, said first wall units forming substantially triangular conduit-like spaces with said inner container wall of said waste-heat tank, said conduit-like spaces being provided as said regions for downwardly directed fluid flow; and which includes means defining a space about said heat transfer surface elements, which space is provided as said region for upwardly directed fluid flow alternately and laterally between said substantially triangular conduit-like spaces that serve as said regions for downwardly directed fluid flow.

4,538,677

HELICOIDALLY FINNED TUBES

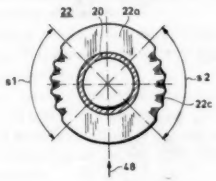
János Bódás; Árpád Bakay; István Papp; György Pálfalvi, and Gyula Kovács, all of Budapest, Hungary, assignors to Energiagazdalkodasi Intezet, Budapest, Hungary

Filed Apr. 5, 1983, Ser. No. 482,291

Claims priority, application Hungary, Apr. 6, 1982, 1057/82

Int. Cl.³ F28F *1/36*

U.S. Cl. 165—146 **1 Claim**



1. In a helicoidally finned heat exchange tube, comprising an inner tubular member and an outer helical member, the helical member having substantially circular and solid turns perpendicular to the surface of the tubular member and having ripples which extend inwardly from the outer periphery of the turns and the depths of which decrease radially inwardly, adjacent turns being separated from one another by a substantially continuous gap; the improvement in which the helical member (**22**) has rippled sections (**S1, S2**) alternating with level sections, the rippled sections subtending an angle not exceeding about 90 degrees and the level sections having a continuous smooth surface, and both types of sections on successive turns registering with one another in the direction of the axis (**32**) of the tubular member (**20**) and the level sections on successive turns defining between them gaps confined by walls having smooth surfaces, thereby facilitating a cleaning of said gaps between said smooth surfaces following deposit of solids in said gaps between said smooth surfaces from gas flowing in a direction perpendicular to the bisector of said angle subtended by said rippled sections, the spacing of the sections being substantially equal to a quarter of the circumference of the tubular member so that the rippled sections of the helical member occupy diametrically opposite positions on the tubular member.

4,538,678

HEAT EXCHANGING DEVICE

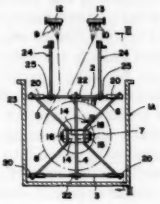
Masafumi Fukumoto, Amagasaki, Japan, assignor to Nisshin Chemical Industry Co., Ltd., Amagasaki, Japan

Filed Jul. 29, 1982, Ser. No. 403,227

Int. Cl.³ F28D *7/00*; F28F *9/00*

U.S. Cl. 165—162 **10 Claims**

1. A heat-exchanging device comprising a first fluid retaining means; at least two opposed substantially V-shaped support plates, the plates being within the retaining means and having a plurality of through holes arranged as a matrix having ranks; a plurality of heating tubes of a fluorocarbon resin passing in parallel, spaced-apart relationship through said matrix of holes



as to define a spiral path, and means for supporting the V-shaped plates within the first fluid retaining means comprising an upper support frame in parallel with a lower support frame, whereby a second fluid circulating through the tubes exchanges heat with the fluid in the retaining means.

4,538,679

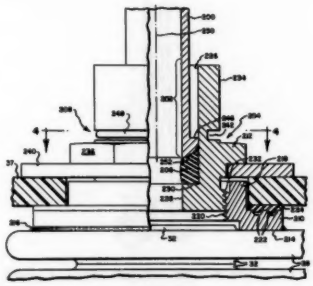
FLUID COUPLING ASSEMBLY

John T. Hoskins, 16 Cobblestone Ct., Orchard Park, N.Y. 14127; Robert G. Zillig, 4401 Overlook Dr., Williamsville, N.Y. 14221, and Steven R. Zillig, Williamsville, N.Y., assignors to John T. Hoskins, Orchard Park and Robert G. Zillig, Williamsville, both of, N.Y.

Filed Nov. 19, 1984, Ser. No. 673,043

Int. Cl.³ F28F *9/04*

U.S. Cl. 165—178 **18 Claims**



1. A fluid coupling assembly for connecting an oil cooler disposed within a header of a radiator to the tubular connector end portion of an oil line, the header having at least one aperture in a wall thereof which receives a portion of said fluid coupling assembly, the oil cooler having a port aligned with said aperture, and said tubular connector end portion having a terminal end; wherein the improvement comprises

a tubular fitting having spaced apart first and second portions and a bore extending through said portions, the first portion being brazed to said oil cooler in fluid-tight relationship about said port, and the second portion extending through said aperture and being secured to said header wall in fluid-tight relationship about said aperture, the tubular connector end portion being telescoped within said bore to an assembled position;

a tubular cylindrical elastomeric seal mounted within the bore, said seal being axially compressed when the tubular connector end portion and the tubular fitting are in their assembled position to provide a fluid-tight seal between

said oil line tubular connector end portion and said oil cooler; and

coupler means holding the tubular fitting and the tubular connector end portion in their assembled position, said coupler means including an outwardly extending surface on the tubular connector end portion, and said coupler means further including catch means on the tubular fitting, said catch means being a resilient clip having circumferentially spaced apart radially inwardly extending engaging means which can be moved radially outwardly against spring bias as the tubular fitting and the tubular connector end portion are telescoped together into their assembled position, the radially inwardly extending engaging means of the resilient clip being biased into locking engagement with said outwardly extending surface when the tubular fitting and the tubular connector end portion are in their assembled position whereby the parts are held together in their assembled position.

4,538,680

GUN BELOW PACKER COMPLETION TOOL STRING

Emmet F. Brieger, Albuquerque, N. Mex.; Flint R. George, and Edward A. Colle, Jr., both of Katy, Tex., assignors to Geo Vann, Inc., Houston, Tex.

Filed Jun. 3, 1982, Ser. No. 384,508
Int. Cl.³ E21B *43/11*
U.S. Cl. 166—55 **32 Claims**

1. In a borehole which extends from a wellhead down through a formation located downhole thereof which is to be completed, a perforating gun having a gun firing head connected to a lower tubing string, the tubing string is connected to a packer device seated downhole at a location to locate the gun adjacent to said formation, the improvement comprising:

an upper tubing string having a packer seal nipple attached at the lower end thereof for sealingly engaging a central passageway of the packer so that a passageway is formed from the wellhead down to the gun head when the packer seal nipple is lowered into the packer device; a tubing extension connected to and underlying the packer seal nipple;

a barrier means located within the lower tubing string in underlying relationship respective to the packer, said barrier means is of a configuration to isolate the gun firing head from the packer, and to be ruptured when the tubing extension extends therethrough;

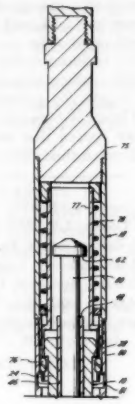
whereby, the gun can be left downhole isolated from well fluids until the time arrives to complete the well, whereupon the upper tubing string is sealingly engaged with the packer, the barrier ruptured, and the gun detonated.

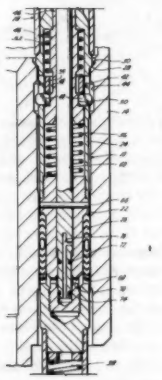
4,538,681

SOFT SET AND PULL LATCH AND SETTING TOOL FOR A WELL MEASURING INSTRUMENT

Russell A. Johnston, Houston, Tex., assignor to Cameo, Incorporated, Houston, Tex.

Filed Dec. 13, 1984, Ser. No. 681,049
Int. Cl.³ E21B *23/03*
U.S. Cl. 166—125 **5 Claims**





1. A setting tool for setting a well tool having a fishing shoulder and a no go shoulder in a well conduit without requiring shear pins comprising,

a housing,

a skirt connected to the housing and adapted to extend over the fishing shoulder and engage the no go shoulder, said skirt including an internal releasing recess,

a plurality of transversely and longitudinally movable dogs positioned in the skirt,

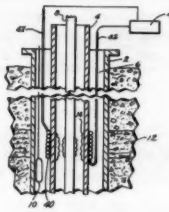
spring means in the skirt urging the dogs upwardly and away from the releasing recess for allowing the dogs to engage the fishing shoulder of the well tool and support the well tool for setting the well tool in the well conduit but whereby upward movement of the housing relative to the well tool moves the releasing recess into alignment with the dogs and allows the setting tool to disengage from the well tool.

4,538,682

METHOD AND APPARATUS FOR REMOVING OIL WELL PARAFFIN

James W. McManus, 515 San Salvador Dr., Dunedin, Fla. 33528; Elmer Winckler, 3605 Arctic Blvd., #241, Anchorage, Ak. 99503, and James Backus, 4123 Wills Rd., Cheyenne, Wyo. 82001

Filed Sep. 8, 1983, Ser. No. 530,366
Int. Cl.[3] E21B *36/04, 37/00*
U.S. Cl. 166—255 46 Claims



1. A method of removing paraffin build up from an oil well that includes tubing and a casing, comprising:

determining the location of a temperature gradient in the oil well, the temperature gradient including a relatively low temperature portion;

introducing a heating element into the oil well;

positioning the heating element in the vicinity of the relatively cooler portion;

selectively heating the relatively cooler portion of the oil well to at least the temperature about that of the melting point of paraffin without imparting a substantial amount of heat to portions of the oil well other than the relatively cool portion.

43. Apparatus for removing and/or preventing the build up of paraffin in an oil well comprising:

means for determining the location of the likelihood of paraffin deposits along the tubing of said well;

an induction heater;

means for positioning said induction heater outside of said tubing between said tubing and casing at said location;

and means for energizing said induction heater while at said location by electrical pulses of relatively short duration.

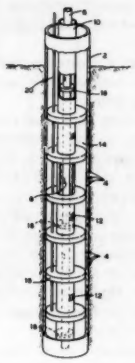
4,538,683

MULTIPLE POINT GROUNDWATER SAMPLER

Eugene T. Chulick, Richmond, Tex., assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation-in-part of Ser. No. 461,313, Jan. 27, 1983, abandoned. This application Mar. 19, 1984, Ser. No. 590,615
Int. Cl.[3] E21B *49/08*
U.S. Cl. 166—264 3 Claims

1. A device for sampling groundwater at individual horizons independently within a multiple screened monitoring well comprising: an inner cylinder having a first plurality of screened perforations; an outer cylinder concentrically arranged about and contiguous with said inner cylinder, and having a second plurality of screened perforations; the perforations in one of the said plurality of screened perforation being circumferentially offset; means for rotating the inner cylinder about its longitudinal axis to sequentially align selective first and second screened perforations thereby establishing communication with each individual horizon to allow the flow of groundwater through said first and second screened perforations into the inner cylinder; pumping means in communication with the inner cylinder is removing each groundwater sample from the inner cylinder; and packing means for isolating each individual horizon from other horizons within the monitoring well.

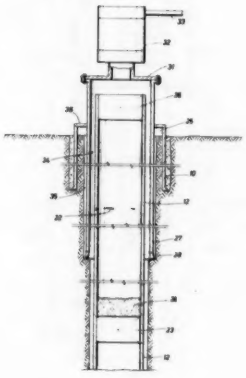


4,538,684

REPAIR OF SHALLOW CASING LEAKS IN OIL WELLS

Robert E. Sheffield, Kenner, La., assignor to Shell Western F&P Inc., Houston, Tex.

Filed Apr. 9, 1984, Ser. No. 597,978
Int. Cl.[3] E21B *29/10*
U.S. Cl. 166—277 20 Claims



1. In a production oil or well installation the method of repairing damage, such as a leak, in an outermost damaged string of casing or production string positioned concentrically within a well conductor or drive pipe of larger diameter forming an annular space therebetween, said method comprising,

determining the depth in the damaged casing string at which the damage exists,

closing the bore of the damaged casing string at a selected distance below the damage therein,

closing the upper end of the damaged casing string during the repair operation,

providing access to the upper end of the annular space between the well conductor and the damaged casing string,

providing a section of a protective casing string with a milling shoe at the lower end thereof, said protective string and said milling shoe being of a size to fit within the

annular space formed between the damaged casing string and the well conductor,

vertically positioning the milling shoe at the lower end of said section of protective casing string in the top of the annular space between said damaged casing string and the well conductor,

drilling the section of protective casing string into the earth formation while removing the earth formation outside the damaged casing string,

repeatedly connecting additional sections of protective casing string in end-to-end relationship to the first section milled into the earth formation and continuing to mill the protective string into the earth formation until the milling shoe at the lower end of the protective string is a selected depth below the damage in said damaged casing string,

pumping cement into annular spaces formed on both sides of the protective string to cement the protective string to the earth formation on one side thereof and to the damaged casing string on the other side thereof to a selected distance below the damage therein,

allowing cement to harden, and

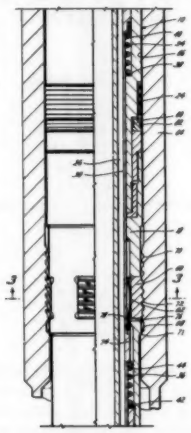
opening the previously-closed upper end of the damaged casing string and the bore throughout said string.

4,538,685

LOCKING ANNULUS SAFETY VALVE

Ronald E. Pringle, Houston, and Paul W. Black, Sugarland, both of Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Oct. 7, 1983, Ser. No. 540,080
Int. Cl.³ E21B *34/10*
U.S. Cl. 166—321 **12 Claims**



1. In an annulus subsurface safety valve adapted for installation between inner and outer concentric tubular members having a housing for connection to the inner member with a fluid passageway therethrough, valve closure means connected to the housing for opening and closing said passageway, means for controlling movement of the valve closure means including hydraulic actuating means adapted to extend to the surface between the tubular members, the combination of means for locking the housing to the outer member when the fluid passageway is closed comprising,

engaging means carried by the housing for inward and outward movement,

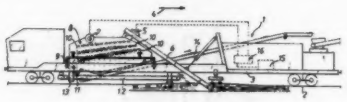
locking means on the valve closure means, said locking means positioned to be out of engagement with the engaging means when the valve closure means is open but is in engagement with and locks the engaging means outwardly in engagement with the outer member when the valve closure means is closed.

4,538,686

BALLAST CLEANING MACHINE

Josef Theurer, Vienna, and Karl Fölser, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Apr. 22, 1983, Ser. No. 487,530
Claims priority, application Austria, Aug. 17, 1982, 3127/82
Int. Cl.³ E01B *27/00*
U.S. Cl. 171—16 **3 Claims**



1. A self-propelled ballast cleaning machine comprising

(a) a ballast excavating chain having an output,

(b) a hydraulic drive for moving the ballast excavating chain,

(c) a ballast screening and storing device arranged to receive the excavated ballast from the output for separating the excavated ballast into waste and cleaned ballast and for storing the cleaned ballast,

(d) a hydraulic vibrating drive for imparting vibrations to the ballast screening and storing device,

(e) a control arrangement for operating the hydraulic drives, the control arrangement including a control element having an input and an output, the input of the control element being connected to the chain moving drive and the output of the control element being connected to the vibrating drive for changing the frequency of the vibrations imparted to the ballast screening and storing device analogously to a respective setting of the control element for storing the ballast in the device, and

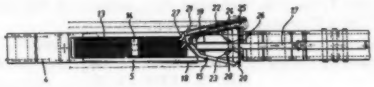
(f) conveyor means for respectively receiving the waste and the cleaned ballast from the ballast screening and storing device, for redistributing the cleaned ballast and for removing the waste.

4,538,687

ARRANGEMENT FOR EXCAVATING AND CONVEYING BULK MATERIAL

Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Aug. 23, 1983, Ser. No. 525,652
Claims priority, application Austria, Sep. 20, 1982, 3504/82
Int. Cl.³ E01B *27/11, 29/05*
U.S. Cl. 171—16 **10 Claims**



1. An arrangement for excavating bulk material and for conveying the excavated bulk material, which comprises

(a) a main endless excavating and conveying chain vertically adjustably mounted on a frame of a track maintenance machine and driven in a first plane,

(b) a polygonal guide for the chain, the guide including

(1) a transverse section operational below the track,

(2) an ascending longitudinal section leading from the transverse section, the transverse and ascending sections forming a transition zone, and

(3) a descending longitudinal section leading to the transverse section,

(c) a drive for driving the endless chain in the polygonal guide,

(d) an auxiliary endless excavating and conveying chain associated with the polygonal guide at least in the transition zone and driven in a second plane substantially perpendicular to the first plane,

(1) the ascending longitudinal section of the polygonal guide being a common channel-shaped guide for ascending portions of the main and auxiliary endless excavating and conveying chains whereby the main and auxiliary chains form a unit for common vertical and pivotal adjustment on the machine frame, and

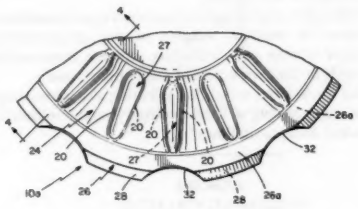
(e) a separate drive for the auxiliary endless chain.

4,538,688

FLUTED COULTER BLADE

Robert J. Szucs, Midlothian, and Sandra M. McNicholas, Riverdale, both of Ill., assignors to Ingersoll Products Corp., Chicago, Ill.

Filed Mar. 2, 1984, Ser. No. 585,378
Int. Cl.³ A01B *15/16*
U.S. Cl. 172—555 **29 Claims**



1. An improved coulter blade comprising a disc plate body having a radially tapered circumferentially straight cutting edge portion on the peripheral extremity thereof, flutes circumferentially spaced apart around said plate, said flutes being radially elongated and positioned radially inwardly from said cutting edge portion, said flutes being axially and circumferentially diminishingly tapered along substantially the entire length thereof to be smaller toward said cutting edge portion.

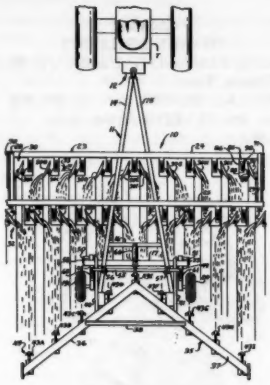
4,538,689

SUBSOIL PLOW POINT

William J. Dietrich, Sr., Congerville, Ill., assignor to DMI, Inc., Goodfield, Ill.

Division of Ser. No. 531,169, Sep. 9, 1983, which is a division of Ser. No. 220,419, Dec. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 934,585, Aug. 17, 1978, Pat. No. 4,245,706. This application Mar. 13, 1984, Ser. No. 566,197
Int. Cl.³ A01B *13/08*
U.S. Cl. 172—700 **5 Claims**

1. A plow point for soil tillage adapted to be mounted on a shank comprising: an elongated, narrow tooth extending forwardly and downwardly of said shank and defining a horizontal cutting edge transverse of the direction of travel for breaking soil and an upper and rearwardly inclined work surface for lifting the broken soil; and first and second wing members having inboard ends attached to the sides of said tooth respectively, and defining leading edges extending from locations respectively rearward and above said cutting edge of said tooth and immediately adjacent said work surface to locations outward, downward and rearward thereof, the rearward inclination of such leading edges of said wings defining respective angles less than 30° with a vertical plane transverse of the direction of travel of said point, said wings being constructed and arranged to cooperate with said tooth to impart a twisting,



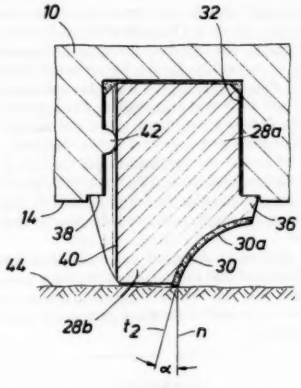
rolling motion to soil broken and lifted by said tooth without substantial lateral displacement of said soil.

4,538,690

PDC CUTTER AND BIT

Lot W. Short, Jr., Dallas, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,668
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **28 Claims**



1. A cutting member for mounting on a drill bit comprising: an elongate body comprised of sintered tungsten carbide, said elongate body having a mounting portion adjacent one end, said mounting portion being adapted to be received in a bore in a drill bit body, and an operating portion adjacent the opposite end, said operating portion being adapted to project outwardly from said drill bit body when said mounting portion is so received in such bore, and said operating portion having a lip formation adjacent the juncture of said mounting and operating portions, said lip formation extending laterally outwardly with respect to said mounting portion whereby it may overly the outer surface of such bit body adjacent such bore when said mounting portion is so received therein, and said lip formation defining a shoulder facing axially toward said one end of said elongate body, and wherein

said operating portion is flared radially outwardly to the outer edge of said shoulder.

4,538,691

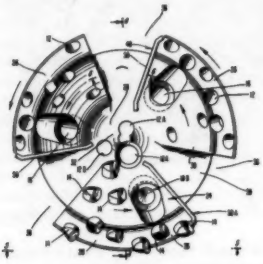
ROTARY DRILL BIT

Mahlon D. Dennis, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Filed Jan. 30, 1984, Ser. No. 575,398

Int. Cl.[3] **E21B** *10/04, 10/60*

U.S. Cl. 175—393 **22 Claims**



1. A rotary drill bit for cutting in earth formations, comprising:

a bit body rotatable about its longitudinal axis and including a cutting face having a peripheral edge and a central recess extending longitudinally rearwardly from said peripheral edge, said recess including side walls facing said longitudinal axis,

a plurality of cutter elements, some of which being mounted in recesses in said peripheral edge, and others of which being mounted in recesses in said side walls to fracture an earthen core formed as the drill cuts through the formation,

a plurality of generally forwardly directed fluid discharge nozzles mounted in said side walls for emitting pressurized drilling fluid such that said drilling fluid travels along said side walls and said peripheral edge and across said cutter elements to flush and cool said cutter elements,

a plurality of lateral discharge passages formed in said body, said passages extending radially through said body from said central recess and extending longitudinally to said peripheral edge to form circumferential interruptions in said peripheral edge, and

a convex protrusion disposed centrally at a longitudinally rearward end of said recess and including a convex deflecting surface, said protrusion arranged to contact and fracture the earthen core and deflect the cuttings to said lateral discharge passages.

4,538,692

METHOD AND APPARATUS FOR COMBINATION WEIGHING WITH MULTIPLE STORAGE CUPS FOR EACH SCALE HOPPER

Nelson R. Henry, Decatur; Duncan B. Cutler, Dunwoody, and William L. Warner, Grayson, all of Ga., assignors to Kliklok Corporation, Greenwich, Conn.

Continuation of Ser. No. 344,630, Feb. 1, 1982, Pat. No. 4,418,771. This application Jul. 18, 1983, Ser. No. 514,515

The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.[3] **G01G** *19/22, 13/16*

U.S. Cl. 177—1 **19 Claims**

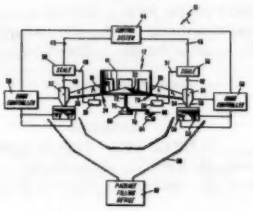
1. A method for making up a desired weight of a solid, free flowing product as a combination of contents of a predetermined number of storage cups comprising the steps of:

(a) establishing acceptable upper and lower limits for an acceptable range of product weight to be achieved;

(b) distributing quantities of the product to a plurality of scale hoppers;

(c) terminating the distribution of the products to each hopper in accordance with a predetermined amount distributed thereto and weighing each amount by a scale associated with each hopper;

(d) feeding the product from each hopper to an available one of at least two storage cups associated with that particular hopper;



(e) registering the weight of product stored in each of the storage cups of the system;

(f) calculating the total weight of successive combinations of the registered product weights of said predetermined number of storage cups including separate combinations using each of the two cups for the hoppers; and

(g) making the desired weight by selecting a combination of storage cups having a total product weight within the established acceptable limits.

4,538,693

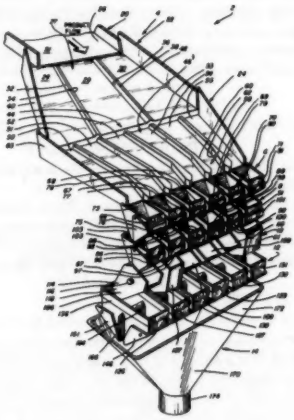
WEIGHING MACHINE

King L. Klopfenstein, Prospect Heights; Robert H. Connors, Chicago, and Steven P. Bergholt, Elgin, all of Ill., assignors to Triangle Package Machinery Co., Chicago, Ill.

Filed May 31, 1983, Ser. No. 499,385

Int. Cl.[3] **G01G** *19/22, 13/16, 13/34;* **B67D** *3/00*

U.S. Cl. 177—25 **23 Claims**



1. A weighing machine for providing a quantity of product having a predetermined weight, comprising

feeder means to selectively transport product supplied by a product source;

a plurality of accumulating means to receive product from said feeder means and selectively discharge discrete amounts of product therefrom;

a plurality of weighing-divertor means, one for each accumulating means, to receive a discrete amount of product from one of said accumulating means, determine the weight thereof, and selectively discharge said product in one of a plurality of predetermined directions;

a plurality of holding means, multiple holding means for each weighing-diverter means, to receive a discrete weighed amount of product from said weighing divertor means, retain it, and selectively discharge it therefrom; and

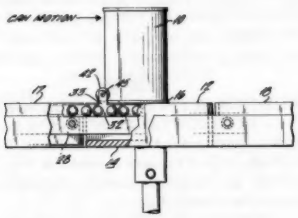
collecting means to receive discrete amounts of product from any of said holding means, consolidate it, and direct it to another location.

4,538,694

CONTACTING MEANS FOR GUIDING CONTAINERS ACROSS WEIGHT PLATFORM

James A. Hudson, Westville, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Dec. 1, 1983, Ser. No. 557,120
Int. Cl.³ G01G *13/00, 19/00*
U.S. Cl. 177—145 **6 Claims**



1. In a system for slidingly conveying across a vibratory weighing platform a train of containers each to be weighed as it slides across said platform and each having a peripheral flange portion adjacent the bottom thereof extending horizontaliy outward from at least the upstream side of said container, comprising chain means moving horizontally below the top of said platform, and contacting means mounted on said chain means for contacting the upstream sides of said containers as they move across said platform, the improvement, wherein:

said contacting means comprises a contactor extending upwards from said chain means and adapted to extend around said flange portion without contacting it and into contact with an upstream side portion of said container which is located adjacent but above said flange portion.

4,538,695

BATTERY DRIVEN GOLF CART

Grodon E. Bradt, Kinetico Center, Busch, Ark. 72620

Filed Jun. 14, 1984, Ser. No. 620,559
Int. Cl.³ B62D *51/02, 61/08*
U.S. Cl. 180—19.2 **15 Claims**

1. A self propelled vehicle for use as a golf cart or the like for person and light load carrying purposes, said vehicle comprising:

a frame comprising a floor section journalling a pair of drive wheels at the rear of the vehicle that are rotatable about a common axis extending transversely of the vehicle,

said wheels being spaced apart to either side of the vehicle,

a riding platform having forward and rear ends carried by said frame floor section between said drive wheels and disposed at a level adjacent said common axis with said rear end thereof being open for person mounting of same from the rear of the vehicle,

said frame further comprising a forwardly extending section,

a steerable front wheel mounted on said frame forwardly extending section,

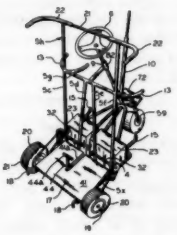
said frame further comprising an uprignt hand hold section projecting upwardly from said floor section thereof adjacent the forward end of said platform and disposed generally transversely of said vehicle,

said platform defining right and left hand standing positions for carrying a person in upright position who has mounted said platform from the rear of the vehicle,

said frame hand hold section including a hand hold on either side of said vehicle at an elevation about said platform for convenient hand grasping by a person standing on said platform at the respective platform standing positions,

said frame journalling a hand wheel adjacent the level of said hand holds,

means for coupling said hand wheel to said steerable front wheel for steering said vehicle,



electric motor drive means for separately driving said driving wheels including battery means forming the source of electrical energy for driving said motor means,

a drive speed control lever mounted for movement longitudinally of said vehicle and located adjacent said platform,

and means controlled by said movement of said control lever for controlling said motor drive means to provide a zero, low and high speed driving action on said driven wheels,

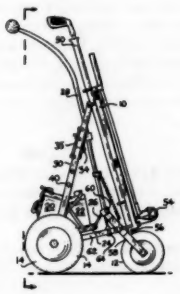
said control lever projecting above said platform, for foot action, by a person standing at one of said platform positions for transportation by said vehicle, for effecting said control of said controlled means.

4,538,696

COLLAPSIBLE ELECTRIC GOLF CART

Lee T. Carter, 3400 Portola Dr. #11, Santa Cruz, Calif. 95062

Filed Jul. 29, 1983, Ser. No. 518,619
Int. Cl.³ B62D *51/04*
U.S. Cl. 180—19.3 **14 Claims**



1. An electrically powered golf cart comprising:

a tricycle including

a single forward wheel, and first and second rear wheels,

axle means supporting said rear wheels,

a drive gear assembly for rotating said axle means;

a controllable electric motor for providing rotational power to said drive gear assembly;

a rack for supporting a plurality of golf clubs in vertical parallel spaced relation substantially over said foward wheel;

means for coliapsing the golf cart into a flat, compact unit without removal of the golf clubs from said rack;

a pair of triangular frames forming the framework of said cart, each of said pair of frames being pivotally coupled to said axle means and to the top and bottom sides of said rack, said rack forming one leg of the triangular frame for each of said pair of frames;

a control handle movable substantially vertically within said framework for controlling the excitation of said motor and the braking of said forward wheel; and

a frame for mounting a storage battery, said frame being supported by hooks removably attached to members of said framework and further supported by a linkage pivotally connected to said movable control handle, whereby the raising of said handle moves said frame toward the center of said framework.

4,538,697

VIBRATION-ABSORBING SYSTEM FOR AN AUTOMOTIVE VEHICLE

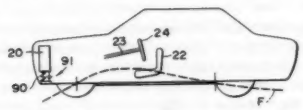
Akira Muroi, Kawasaki; Masakatsu Sano, Tokyo; Junichi Kamiya, Yokohama; Masao Okajima, Yamato, and Arifumi Inoue, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 10, 1981, Ser. No. 320,136

Claims priority, application Japan, Nov. 13, 1980, 55-159799

Int. Cl.³ B60K *11/04*; B60R *18/02*

U.S. Cl. 180—68.4 **13 Claims**



1. A vibration-absorbing system for a vehicle having a body, said vehicle normally having thereon a vehicle accessory utilized in operation of said vehicle, said system comprising:

(a) means for securing said vehicle accessory to said vehicle body, said securing means being nonresilient; and

(b) resilient means positioned by said securing means between said vehicle accessory and said vehicle body for permitting resonant movement of said accessory for damping vibration of said vehicle;

the mass of said accessory and spring modulus of said resilient means being effective to damp relatively low frequency vehicle vibrations with a frequency equal to the resonance frequency of said vehicle body in relation to forced vibration thereof, said low frequency vibrations being in the range of approximately 20 to 30 Hz.

4,538,698

MOTOR-DRIVEN POWER STEERING SYSTEM

Akio Hashimoto, Kawasaki, and Tomio Yasuda, Kasukabe, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 16, 1984, Ser. No. 571,272

Claims priority, application Japan, Jan. 17, 1983, 58-5493

Int. Cl.³ B62D *5/04*

U.S. Cl. 180—79.1 **5 Claims**

1. A motor-driven power steering system comprising:

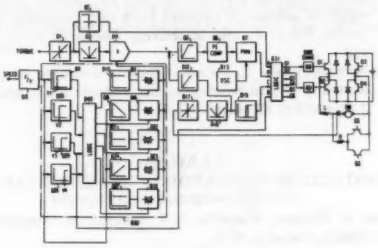
an electric motor,

coupling means for coupling the motor to the steering shaft of a vehicle,

torque detecting means for detecting the steering torque applied by the driver,

a motor braking means connected to the coil in the motor, and

an electronic control apparatus for dividing the range of the velocity of the vehicle into at least three ranges, the control apparatus energizing the motor according to the



output signal from the torque detecting means in the first range of the velocity, the control apparatus de-energizing the motor in the second range of the velocity, the control apparatus energizing the braking means in the third range of the velocity.

4,538,699

FLUID-CUSHION SUPPORTING ARRANGEMENT FOR HORIZONTAL CONVEYANCE

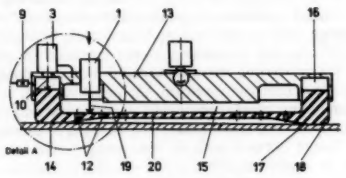
Fritz Kutscher, Leipzig, and Christian Zschocke, Erdmannsdorf-Augustusburg, both of German Democratic Rep., assignors to Bauakademie der Deutschen Demokratischen Republik, Berlin, German Democratic Rep.

Filed Mar. 31, 1983, Ser. No. 480,664

Claims priority, application German Democratic Rep., Apr. 20, 1982, 239145

Int. Cl.³ B60V *1/00*

U.S. Cl. 180—125 **8 Claims**



1. A fluid-cushion supporting arrangement for horizontal conveyance, comprising

a supporting platform having a center and a marginal portion;

a flexible angular sealing element arranged under said platform in the region of said marginal portion and formed as a sealing piston, said sealing piston having a substantially horizontal leg which extends toward said center and forms together with said supporting platform a fluid chamber, and a substantially vertical leg which forms together with said supporting platform a control pressure chamber and is vertically adjustably inserted in the latter;

inlet means for supplying a fluid into said fluid chamber;

communicating means including a passage communicating said fluid chamber with said control pressure chamber;

a pressure-regulating element arranged in said passage;

first sensing means arranged to contact with said substantially horizontal leg of said sealing piston and associated with said inlet means so that said inlet means supplies the fluid into said fluid chamber in dependence upon a height of said substantially horizontal leg of said sealing piston, sensed by said first sensing means; and

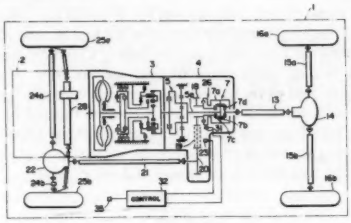
second sensing means extending into said control pressure chamber so as to be in contact with said substantially vertical leg of said sealing piston and associated with said pressure-regulating element, so that in dependence upon a position of said second sensing means, which is determined by a pressure in said control pressure chamber and therefore by a height of said sealing piston, said communicating means is opened or closed for flowing of the fluid from said fluid chamber into said control pressure chamber or vice versa, so as to change a pressing force of said sealing piston.

4,538,700

FOUR-WHEEL DRIVE SYSTEM WITH DECELERATION-RESPONSIVE CENTER DIFFERENTIAL CONTROL

Kunihiko Suzuki, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 15, 1984, Ser. No. 589,774
Claims priority, application Japan, Apr. 1, 1983, 58-48337[U]
Int. Cl.³ B60K *17/34*
U.S. Cl. 180—248 **13 Claims**



1. A four-wheel drive vehicle having front and rear wheels and an engine, said vehicle comprising;

(a) a four-wheel drive system for transmitting power from the engine to the front wheels and the rear wheels, said four-wheel drive system comprising;

(i) a center differential connected between the front wheels and the rear wheels for absorbing a rotational speed difference between the front wheels and the rear wheels, and

(ii) differential restraining means capable of bringing said center differential into a restrained condition in which the function of said center differential is restrained, and

(b) a control system comprising

(i) deceleration sensing means for sensing the deceleration of the vehicle,

(ii) condition sensing means for detecting whether said center differential is in or out of said restrained condition, and

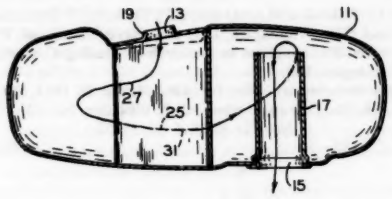
(iii) control means, connected with said deceleration sensing means and said condition sensing means, for controlling said center differential by actuating said differential restraining means in accordance with signals of said deceleration and condition sensing means, said control means being arranged to actuate said differential restraining means to bring said center differential into said restrained condition if the sensed deceleration of the vehicle is equal to or higher than a predetermined value, and at the same time said center differential is out of said restrained condition.

4,538,701

MUFFLER

David C. Lowery, Manchester, Mich., and Robert W. Alyea, Grafton, Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Jul. 19, 1982, Ser. No. 399,720
Int. Cl.³ F01N *1/08*
U.S. Cl. 181—274 **5 Claims**



1. An exhaust gas muffler comprising: an elongate enclosure having a longitudinal axis, said enclosure having an inlet for receiving exhaust gas from an engine, and an outlet for venting the exhaust gas to the atmosphere, exhaust gas flow and sound propagation within said enclosure being generally axially between the inlet and outlet, said enclosure being generally ellipsoidal in shape and having non-zero continuously varying curvature at substantially all points on its inner surface; said outlet comprising a tube having a generally straight imperforate portion thereof disposed within the enclosure with one end thereof opening to the exterior of the enclosure and the other end opening within the enclosure, said tube portion being generally perpendicular to the axial flow of the gas and sound propagation; and an imperforate baffle contained within the enclosure intermediate the inlet and outlet, said baffle being transverse to the longitudinal axis of the enclosure and having edges spaced inwardly from the enclosure thereby forming a plurality of gas flow openings.

4,538,702

SHOCK ABSORBER FOR FALL PROTECTION SYSTEM

J. Thomas Wolner, Red Wing, Minn., assignor to D B Industries, Inc., Red Wing, Minn.

Filed Mar. 21, 1983, Ser. No. 477,385
Int. Cl.³ A62B *35/00;* **B60R** *21/10*
U.S. Cl. 182—3 **3 Claims**

1. A shock absorber for fall protection systems, said shock absorber comprising:

at least one piece of webbing having first and second ends and longitudinal and latitudinal fibers;

attachment means at said first and second ends; and

a smooth-edged piercing member initially piercing said webbing at first and second piercing points adjacent said first and second ends, respectively, the linear distance long the entire length of said webbing being greater than the distance between said first and second piercing points.

4,538,703

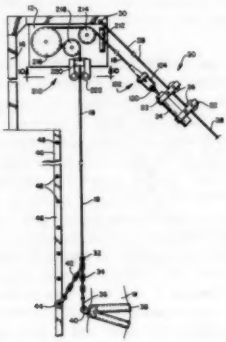
CLIMBING AID AND SAFETY DESCENT SYSTEM

J. Nigel Ellis, Wilmington, Del., and Meyer Ostrobrod, Philadelphia, Pa., assignors to Research & Trading Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 430,244, Sep. 30, 1982, Pat. No. 4,458,781. This application Jul. 9, 1984, Ser. No. 628,893

Int. Cl.³ A62B *1/10, 35/02*

U.S. Cl. 182—5 **53 Claims**



1. A climbing aid and safe descent system comprising:

(a) a cable having a first end portion adapted for removable connection to a user of the system and a second end portion attached to a counterweight;

(b) an elongated guide means secured at its ends and carraige means supporting said counterweight for movement along said guide means; and

(c) a cable controller assembly including:

(i) a first pulley making rotatable contact with said cable;

(ii) centrifugally-actuated brake means; and

(iii) means coupling said first pulley to said brake means, said coupling means in the cable controller assembly permitting free rotation of said first pulley and the concommitant free passage of said cable through said controller assembly at pulley rotational speeds below a predetermined value, and said coupling means coupling said first pulley to said brake means at pulley rotational speeds above said predetermined value, to restrict the pulley rotational speed and to restrict passage of said cable to a controlled rate.

4,538,704

MULTIPLE-PERSON EVACUATION METHOD AND APPARATUS

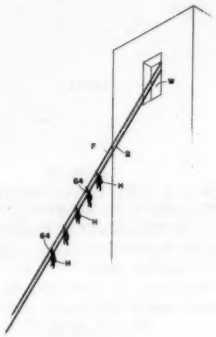
William E. Forrest, Denver, Colo., assignor to Advanced Evacuation Systems, Denver, Colo.

Filed Mar. 2, 1984, Ser. No. 585,831

Int. Cl.³ A62B *1/02, 35/00*

U.S. Cl. 182—10 **27 Claims**

1. In combination in a system for lowering several persons at a time outwardly through an exit opening in an elevated evacuation area to a landing site therebeneath: means including a rope support for positioning near the exit opening spaced well above the lower edge of the latter, a first rope to be anchored in the evacuation area preparatory to being passed out through the exit opening over said rope support and subsequently anchored at the landing site, a second rope to be reaved over said rope support alongside the first, a plurality of body harnesses, harness attachment means for connecting the body harnesses at fixed spaced intervals along a section of said second rope outwardly beyond said rope support, means for detachably connecting said harness attachment means to said first rope for sliding movement therealong outwardly beyond said rope support, and descent control means for use within the evacuation area ahead of said rope support for belaying the descent of persons occupying said body harness using said second rope as they descend the first, said means including a friction drum for receiving one or more turns of said second rope wrapped therearound, said drum having an open end whereby turns of said second rope taken from a slack section thereof hanging free from said drum can be added or taken off the latter without accessing an end thereof while the portion of said second rope beyond said drum is tensioned and under load.



4,538,705

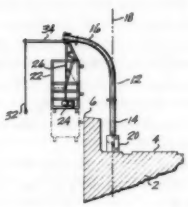
METHOD AND APPARATUS FOR MOVING A PLATFORM INTO A SUSPENDED OUTBOARD POSITION

Ole E. Leivestad, Renton, Wash., assignor to Spider Staging, Inc., Renton, Wash.

Filed Mar. 7, 1984, Ser. No. 587,216

Int. Cl.³ E04G *3/10*

U.S. Cl. 182—142 **9 Claims**



1. A method of moving a platform from a position on a roof of a structure to a suspended position outboard of the structure, comprising:

providing a pair of stanchions, each of a type having a vertical portion and an upper horizontal portion;

providing the horizontal portion of each stanchion with handhold means that is carried by and rotates with its corresponding horizontal portion;

mounting the stanchions at spaced apart locations on the roof of the structure, for rotation about axes coinciding

with said vertical portions, between an inboard position in which the horizontal portions of the stanchions project inwardly over the roof of the structure and an outboard position in which the horizontal portions of the stanchions project outwardly from the structure;

positioning an elongated platform on the roof of the structure, with each stanchion in its inboard position, with a first end of the platform located under the horizontal portion of a first one of the stanchions, and with the second end of the platform located under the horizontal portion of the second stanchion;

connecting the first end of the platform to the first stanchion by a first suspension system including an upper end attached to the horizontal portion of the first stanchion and a lower end attached to the platform, and connecting the second end of the platform to the second stanchion by a second suspension system including an upper end attached to the horizontal portion of the second stanchion and a lower end attached to the platform, each said system including a winch drum which when rotated in one direction causes the platform to move upwardly and when rotated in the opposite direction causes the platform to move downwardly;

locating two workers on the platform, one at each end of the platform;

operating the suspension system for raising the platform up off of the roof, into a position from which the platform can be moved into its outboard position by a rotation of the stanchions; and

moving the elevated platform into its outboard position, in the following manner:

one of the workers pulls on the handhold means of the horizontal portion of the first stanchion while the second worker pushes on the handhold means of the horizontal portion of the second stanchion, until the horizontal portion of the first stanchion is generally aligned with the platform;

then the first worker pushes on said means of the horizontal portion of the first stanchion while the second worker pulls on said means of the horizontal portion of the second stanchion, until the first end of the platform is located outboardly of the structure and the first stanchion is generally in its outboard position; and

then the first worker again pulls on said means of the horizontal portion of the first stanchion while the second worker again pushes on said means of the horizontal portion of the second stanchion, until the stanchions are in their outboard positions and the platform is in an outboard position generally parallel to the face of the structure.

4,538,706

PROGRESSIVE SAFETY

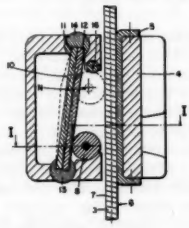
Werner Koppensteiner, Vienna, Austria, assignor to Otis Elevator Company, Farmington, Conn.

Filed Jun. 13, 1983, Ser. No. 503,943

Claims priority, application Austria, Mar. 21, 1983, 989/83

Int. Cl.³ B66B *5/18*

U.S. Cl. 187—90 **2 Claims**



1. A progressive safety device in an elevator having a governor that has a cable extending to a car and that pulls on the cable when at certain car speeds and accelerations for braking an elevator car or counterweight characterized by:

a housing, said housing being attached to the elevator car or the counterweight and adapted for receiving a guide rail;

a brake shoe, said shoe being attached to the housing and located on one side of the rail;

a spring assembly, said assembly being attached to the housing and defining a tapered area on a second side of the rail opposite said one side;

a roller, said roller being located within said tapered area and adapted to be connected to a governor connected to the car or counterweight for being directed initially towards the narrow end of said area by the governor cable to engage the rail and thereupon be forced progressively further in the narrow end by rolling on the rail as the car or counterweight moves; and

a soft metal stop that is located in the housing in said narrow portion of said tapered area, said stop being in a position therein to be engaged by said roller and made of softer metal than the roller so that wear on the stop compensates for wear in the brake shoe.

4,538,707

TWO WHEEL RIM BRAKE WITH ROTATABLE ACTUATING ELEMENT

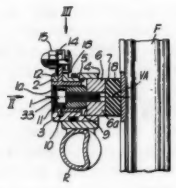
Robert Schoch, Hilzingen, Fed. Rep. of Germany, assignor to Weinmann GmbH & Co. KG, Singen, Fed. Rep. of Germany

Filed Nov. 19, 1982, Ser. No. 442,959

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147203; Sep. 9, 1982, 323351

Int. Cl.³ B62L *1/10*

U.S. Cl. 188—24.22 **9 Claims**



1. A brake for use with a wheel rim of a wheeled cycle, said brake comprising a pair of housings; means for mounting said housings on opposite sides of and adjacent said rim; a support slideably but non-rotatably mounted in each of said housings for sliding movements along an axis of displacement in directions toward and away from said rim; a brake lining carried by each of said supports in a position to engage said rim; a threaded spindle connected to each of said supports for sliding movements therewith; a threaded bush mounted in each of said housings for rotation about said axis and in threaded engagement with the associated spindle; actuating means coupled to each of said bushes for rotating the latter simultaneously; and means reacting between each of said housings and the associated actuating means for preventing movement of the latter longitudinally of said axis, whereby rotation of said bushes effects sliding movements of said supports along said axis.

4,538,708

DISC BRAKE WITH A PAD RETAINING SPRING

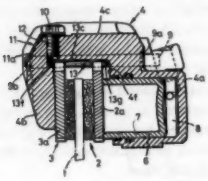
Masayuki Seki, Nagano, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Japan

Filed Sep. 30, 1982, Ser. No. 431,689

Claims priority, application Japan, Sep. 30, 1981, 56-145552[U]; Sep. 30, 1981, 56-145553[U]; Sep. 30, 1981, 56-145555[U]; Sep. 30, 1981, 56-145556[U]

Int. Cl.³ F16D *65/02*

U.S. Cl. 188—73.38 7 Claims



1. A disc brake arrangement for vehicles, comprising:

(A) a disc rotatable with a wheel;

(B) a pair of friction pads mounted on rear plates and disposed on opposite sides of said disc and movable along the axis of said disc;

(C) a caliper including:

(1) a bridge portion having an inner wall extending transversely of said disc,

(2) an operable portion defining a hydraulic cylinder with a piston therein, said piston being operably connected to one of said pads to move it into contact with said disc, and

(3) a reaction portion abutting the other said pad, whereby, when said piston is actuated it moves said first pad into contact with said disc, thereby creating a reaction which causes said caliper to move in the opposite direction resulting in said reaction portion pushing said other pad into contact with said disc; and

(D) a pad spring including two pairs of pad-engaging portions for retaining said friction pads independently of each other in the radial direction of said disc under a given load and comprising:

(1) a central joining portion extending transversely across said disc, pads, and rear plates, said joining portion engaging a rib portion depending from said inner wall,

(2) a first pair of pad-engaging portions formed by arms extending outwardly from one end of said joining portion at a slight angle with respect to said inner wall, said first pair of pad-engaging portions having a width substantially greater than the width of the first of said rear plates, on which said one pad is mounted, and engaging slidably with the upper portion of said first rear plate,

(3) a second pair of pad-engaging portions formed by arms extending outwardly from the other end of said joining portion at a slight angle with respect to said inner wall, said second pair of pad-engaging portions having a width substantially equal to the width of the other of said rear plates, on which said other pad is mounted, and engaging with the upper portion of said other rear plate, and

(4) a stopper element depending from the end of each pad engaging portion for restraining said pads from free movement along the disc axis.

4,538,709

WHEELED GARMENT BAG

Marvin E. Williams, Worthington; David B. Chaney, Columbus, and Donald J. Rebele, Worthington, all of Ohio, assignors to The Huntington National Bank, Columbus, Ohio

Filed Jul. 11, 1983, Ser. No. 512,734

Int. Cl.³ A45C *5/14, 13/26, 13/30, 13/38*

U.S. Cl. 190—18 A 4 Claims

1. A luggage device comprising:

(a) a base support unit having wheels extending downward upon which it may roll;

(b) a garment enclosure which, when in an operable position, has its lower portion attached to said base support unit and its upper portion either folded downwardly or raised upwardly;

(c) a linearly extensible, telescoping pole including means for releasably locking it in an extended position, means for attaching said pole at one end to said base support unit, said pole extending upwardly through only said lower portion of said garment enclosure and having a handle near its other end, means for releasably attaching said handle to the top of said upper portion for supporting said garment enclosure when said pole is extended; and

(d) one or more retractable support feet assembled to said base support unit to hold said luggage device upright and to carry additional luggage rested upon them when they are extended outward from said base support unit.

4,538,710

MECHANICAL BRAKE CONTROL DEVICE

Alistair G. Taig, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

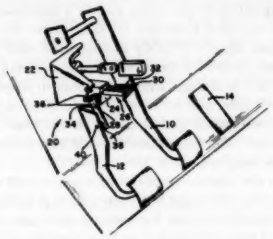
Filed Sep. 22, 1982, Ser. No. 421,218

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—13 A 33 Claims

1. A mechanical brake control device for a vehicle including a brake pedal and a clutch pedal wherein the brake is movable to a brake applied mode during braking, the device comprising a housing adapted for attachment to the vehicle, a connecting member extending from the housing to the brake pedal for movement with the latter, locking means cooperating with the housing and the connecting member to selectively fix the connecting member and the brake pedal relative to the housing, and control means extending from the clutch pedal to the housing, the control means being operable in response to movement of the clutch pedal to render the locking means in an operative mode or an inoperative mode, characterized in that said housing compactly encloses said locking means and defines a guide upon which said locking means is disposed, said

guide being normally disposed in a substantially horizontal plane when the vehicle is also disposed on a substantially horizontal surface, said locking means being movable independently into direct engagement with said connecting member solely in response to the vehicle and said guide being reposi-



tioned angularly relative to the horizontal plane, provided said control means maintains said locking means in an operative mode, and said locking means comprises a ball which frictionally engages said connecting member to fix the latter and said brake pedal in one direction relative to said housing in a brake applied mode.

4,538,711

POWER TRANSMISSION DEVICE EASY TO MOUNT ON A DRIVER

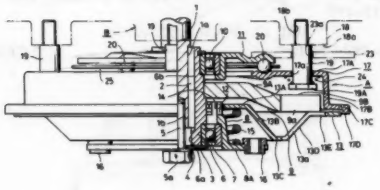
Terasu Takata, Kiryu, and Haruo Inoue, Tokyo, both of Japan, assignors to Ogura Clutch Co. Ltd., Gunma, Japan

Filed Nov. 18, 1983, Ser. No. 553,432

Claims priority, application Japan, Nov. 24, 1982, 57-177358

Int. Cl.³ F16D *41/24*

U.S. Cl. 192—18 R **8 Claims**



1. A power transmission device for installation between a driver including an output rotary shaft and a mounting portion, and a driven machine, comprising:

a hollow tubular shaft adapted to be fitted on said output rotary shaft of said driver for rotation therewith;

an annular output element mounted concentrically on one end of said tubular shaft for rotation relative thereto;

an annular input element rigidly fitted concentrically on an intermediate portion of said tubular shaft for rotational movement together with said tubular shaft;

an annular operating element mounted concentrically on another end of said tubular shaft for rotational movement relative to said tubular shaft through a predetermined circumferential angle;

an annular friction plate interposed between said output element and said input element and mounted on said output element for rotational movement therewith and for displacement axially of said tubular shaft for frictional engagement with said input element;

a first spring for urging said friction plate toward said input element;

an annular brake element arranged concentrically of said tubular shaft and interposed between said operating element and friction plate for displacement axially of said tubular shaft for frictional engagement with said friction plate, said brake element having a plurality of through holes formed therein along a given circumference at circumferentially spaced locations;

means responsive to rotation of said operating element for causing displacement of said brake element axially of said tubular shaft and relative to said operating element;

a plurality of guide elements adapted to be secured to said mounting portion of said driver and axially fitted through respective ones of said through holes of said brake element for permitting axial displacement of said brake element along said guide elements and prohibiting circumferential displacement of said brake elements; and

a plurality of second springs engaging respective ones of said guide elements and urging said brake element toward said operating element,

said input element having at least one first opening formed at a location axially alignable with each of said guide elements, said friction plate having at least one second opening at a location axially alignable with said first opening of said input element so that said guide elements and said second springs can be mounted into and removed from said power transmission device through said first and said second openings when aligned with each other; and

wherein said friction plate comprises a radially extending inner peripheral portion which is urged by said first spring, a first tapered portion obliquely and radially outwardly extending from said inner peripheral portion toward said output element, a second tapered portion located radially outwardly of said first tapered portion and obliquely and radially outwardly extending toward said input element, and an annular peripheral portion radially outwardly extending from said second tapered portion, so that said friction plate covers said input element and said output element.

4,538,712

CLUTCH BRAKE ARRANGEMENT FOR FARM WORKING MACHINERY ETC.

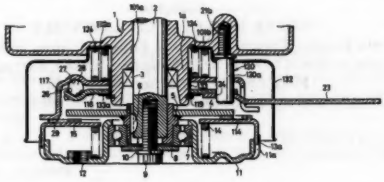
Shigeo Nagai, Nagano, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Japan

Filed Feb. 3, 1983, Ser. No. 463,563

Claims priority, application Japan, Feb. 19, 1982, 57-22406[U]; Feb. 19, 1982, 57-24407[U]

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—18 R **10 Claims**



1. A clutch brake arrangement for farm working machinery and the like, comprising an engine mount having an axial boss depending therefrom, said boss having a central axial bore extending therethrough, an output shaft extending through said bore, an annular recess surrounding said boss to function as a spring seat, a rotary member rotatably mounted on the lower end of said output shaft, an axially slidable lining plate mounted on said rotary member and rotatable therewith, said lining plate carrying, on its upper surface, an annular clutch lining and an annular brake lining disposed radially outwardly of said clutch lining, an axially slidable pressure plate mounted on said boss, a clutch disc disposed between said lining plate and said pressure plate and fixed to said output shaft for rotation therewith, said pressure plate being normally biased into engagement with said lining plate, a brake spring resiliently disposed between said spring seat and said pressure plate to

constantly bias the pressure plate into engagement with said brake lining on said lining plate and to maintain said lining plate out of engagement with said clutch disc, a cam plate axially slidably mounted on said boss and opposed to said pressure plate, said pressure plate and cam plate, together, defining a ball clamp, and a cam ball riding in said ball clamp, said cam plate being held on said boss by a retaining ring, whereby when said cam plate is rotated, the cam action exerted by said ball causes said pressure plate to move axially out of engagement with said lining plate and to allow said lining plate to engage with said clutch disc.

4,538,713

FRICTION CLUTCH DIFFERENTIAL AXLE

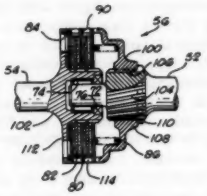
Yuichi Wasada, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,496

Claims priority, application Japan, Oct. 1, 1982, 57-149587[U]

Int. Cl.³ F16D *13/44*; B60B *27/00*

U.S. Cl. 192—54 **18 Claims**



1. An axle having a friction clutch differential comprising
a first axle shaft extending to receive a wheel;
a coaxial second axle shaft extending to receive a wheel;
a clutch between said axle shafts including a clutch housing rotatably driven with said first shaft and having axially extending guides, clutch disks rotatably driven with said second shaft, clutch plates rotatably driven with said axially extending guides, a clutch spring in said clutch housing, and a helical spline coupling between said clutch and one of said axle shafts.

4,538,714

WHEEL HUB CLUTCH ASSEMBLY

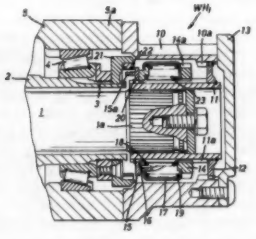
Tooru Kagata, Toyota, and Motoi Fujikawa, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 19, 1983, Ser. No. 524,667

Claims priority, application Japan, Aug. 26, 1982, 57-148316

Int. Cl.³ F16D *11/04*

U.S. Cl. 192—54 **3 Claims**



1. A wheel hub clutch assembly for effecting engagement between a drive axle and a wheel hub in response to rotation of said drive axle, comprising a cylindrical body integrally formed therein with a first clutch element and to be fastened to the outer end of said wheel hub, a sleeve member fixedly mounted on the outer end of said drive axle for rotation therewith and located within said cylindrical body, a clutch member integrally formed with a second clutch element to be engaged with said first clutch element and axially slidably mounted on said sleeve member for rotation therewith, cam means operatively coupled with the outer end of a stationary axle tube for said drive axle and rotatable on said sleeve member, cam follower means axially slidably mounted on said sleeve member for rotation therewith and cooperable with said cam means to be displaced toward said clutch member in response to rotation of said drive axle, and a connecting member engaged with said cam follower means and said clutch member to permit relatively inward movement between said cam follower means and said clutch member,

wherein the improvement comprises:

a first spring arranged between said cam follower means and said clutch member for loading said cam follower means toward said cam means and cooperable with said connecting member for loading said clutch member for movement away from engagement with said first clutch element; and

a second spring arranged in parallel with said first spring between said cam follower means and said clutch member for loading said clutch member for movement toward engagement with said first clutch element and cooperable with said connecting member for resiliently providing an axial space between said cam follower means and said clutch member.

4,538,715

OVERLOAD CLUTCH WITH VIBRATION PROTECTION MECHANISM

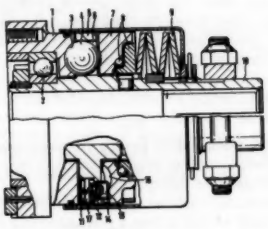
Mathias Konrad, Troisdorf, and Klaus Kämpf, Lohmar, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Dec. 20, 1982, Ser. No. 451,002

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151485

Int. Cl.³ F16D *7/02, 43/20*

U.S. Cl. 192—56 R **2 Claims**



1. An overload clutch for protecting drive lines comprising: a first clutch member and a second clutch member adapted to be placed in driving engagement with each other; aperture means in said first clutch member; first recess means circumferentially distributed in said second clutch member; rolling members held in said aperture means and adapted to be engaged in said first recess means for placing said first and second clutch members in torque-transmitting engagement; a switching ring having therein second recess means corresponding to said first recess means and angularly offset relative thereto when said clutch is in torque-transmitting engagement; circumferentially acting spring means holding said switching ring in said angularly offset position; axial spring means acting against said switching ring to urge said rolling members into torque-transmitting engagement within said first recess means; said switching ring being rotatable against the force of said circumferentially acting spring means when a predetermined nominal torque of said clutch is exceeded to bring said second recess

means in corresponding angular position relative to said aperture means; vibration protection means comprising securing pin means mounted in said first clutch member so as to be axially movable relative thereto to a limited extent, detent means formed in said switching ring for engaging therein said securing pin means when said clutch is in torque-transmitting engagement, and spring means urging said securing pin means into engagement with said detent means; said securing pin means extending into said detent means a distance smaller than the maximum depth of said second recess means to enable said securing pin means to be disengaged therefrom when said nominal clutch torque is exceeded; said vibration protection means preventing vibration-induced movement of said second recess means into corresponding angular position relative to said aperture means.

4,538,716
MULTIPLE-DISC FRICTION CLUTCH AND DIAPHRAGM SPRING THEREFOR

Wolfgang Reik, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

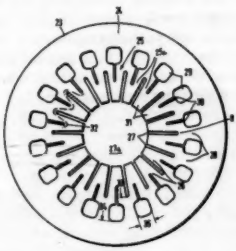
Filed Aug. 23, 1982, Ser. No. 410,845

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204614

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.³ F16F *1/32, 1/34;* **F16D** *21/06, 13/44*

U.S. Cl. 192—70.29 **24 Claims**



1. A friction clutch, especially a multiple-disc clutch, comprising a pair of axially movable pressure plates; a pair of clutch plates flanking said pressure plates; and a diaphragm spring disposed between said pressure plates and including a circumferentially extending marginal portion engaging one of said pressure plates and a second portion disposed radially inwardly of said marginal portion, one of said portions engaging the other of said pressure plates radially inwardly of the locus of engagement between said marginal portion and said one pressure plate so that said pressure plates are biased against the respective clutch plates in the engaged condition of the clutch, said second portion including a part disposed radially inwardly of the region of engagement of said one portion with said other pressure plate and comprising a plurality of sections which are connected to each other at locations disposed radially inwardly of said region of engagement, said second portion defining a substantially centrally located opening and further including an annulus of prongs surrounding said opening, said second portion further having open slots alternating with said prongs and closed slots including enlarged outer portions inwardly adjacent to said marginal portion and inner portions extending toward but short of said opening and overlapping the neighboring open slots, as considered in the radial direction of said diaphragm spring, said open slots being located radially inwardly of said enlarged outer portions.

4,538,717
CONTROL APPARATUS FOR A STEP DRIVE

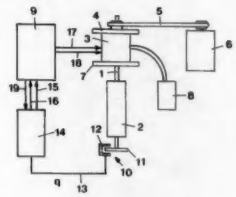
Knud Blohm, Nordborg, and Egon Krogh, Sonderborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Feb. 4, 1983, Ser. No. 463,905

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205500

Int. Cl.³ F16D *67/02;* **B60K** *41/24, 41/28*

U.S. Cl. 192—0.094 **10 Claims**



1. Control apparatus for a step drive assembly which includes a rotatable operating unit and a change-over clutch unit for selectively connecting said operating unit to a continuously running motor or a stationary brake, said change-over clutch unit having input stop and start lines; said control apparatus comprising, a disk connected to said operating unit for rotation therewith and having a circular track with first and second zones, sensor means scanning said zones and outputting a pulse train, an evaluating circuit responsive to said pulse train having a first time comparator circuit for outputting a positional stop signal and a second time comparator circuit for outputting an overload stop signal, said first and second comparator circuits having respective first and second limiting time values associated therewith, said first and second zones having alternating elements with the elements of said first zone being uniformly smaller than the elements of said second zone except that at least one signal element of said first zone is the largest of all said elements, said first time comparator circuit outputting said positional stop signal when said first limiting time value is between the nominal operating speed scanning times for said signal element and for the other elements of said first zone, said second time comparator circuit outputting said overload stop signal when said second limiting value is larger than the nominal operating speed scanning times for said elements of said second zone.

4,538,718
CLUTCH DISC ARRANGEMENT

Paul Maucher, Sasbach, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Jul. 2, 1982, Ser. No. 394,830

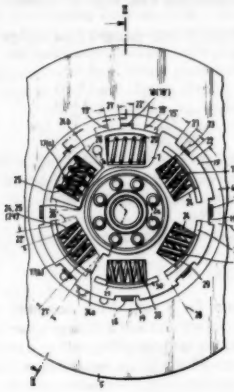
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3126694

Int. Cl.³ F16D *3/66*

U.S. Cl. 192—106.2 **31 Claims**

1. A clutch disc arrangement, especially for the clutches of automotive vehicles, comprising a first component including a hub and first and second annular guides rotatable with said hub and defining between themselves an annular space surrounding said hub; a second component including a clutch disc having portion in said space and being rotatable within limits relative to said first component; first energy storing means interposed between said components to urge said second component to a neutral position and to yieldably resist at least some stages of rotation of said second component relative to said first component; and means for yieldably opposing rotation of said second component relative to said first component after said second component completes a predetermined angular movement from said neutral position, comprising a washer disposed outside of said space and having a radially innermost portion, said washer being resilient as considered in the axial direction of

said hub and bearing against said first component, means for maintaining said washer in prestressed condition including a stressing member rigid with said first component and bearing against said innermost portion of said washer, at least one



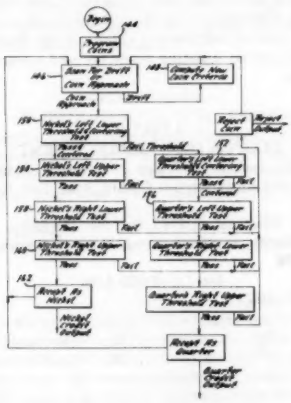
friction pad interposed between said washer and said first component, and second energy storing means interposed between said washer and said first component and being operative to yieldably oppose certain stages of rotation of said washer relative to said first component.

4,538,719

ELECTRONIC COIN ACCEPTOR

Matthew H. Gray, and Robert D. Everett, both of Monroe, Mich., assignors to Hilgraeve, Incorporated, Monroe, Mich.

Filed Jul. 1, 1983, Ser. No. 510,295
Int. Cl.³ G07F *3/02*
U.S. Cl. 194—100 A **42 Claims**



1. A coin inspecting circuit, comprising:

means for generating an input driving signal which is selectively varied between at least two predetermined characteristics;

means for creating an electromagnetic field which is varied in response to said driving signal and for producing alternating signals which are responsive to a conductive object in the presence of said electromagnetic field;

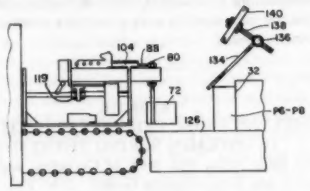
means for measuring said alternating signals and determining whether a conductive object in the presence of said electromagnetic field is an acceptable coin from said alternating signals.

4,538,720

APPARATUS FOR TRANSFERRING ARTICLES BETWEEN CONVEYORS

Jean-Louis Limousin, Clearwater, Fla., assignor to Pet, Incorporated, St. Louis, Mo.

Filed Mar. 25, 1983, Ser. No. 478,899
Int. Cl.³ B65G *47/02*
U.S. Cl. 198—416 **19 Claims**



1. An apparatus for transferring articles between conveyors, comprising in combination:

a first conveyor;

pushing means for simultaneously pushing a plurality of the articles transversely relative to said first conveyor;

gripping means pivotally mounted adjacent to said first conveyor, said gripping means pivoting from a first position for simultaneously grasping a plurality of the articles as the articles are pushed transversely by said pushing means such that toppling of the articles is inhibited during the change of direction of the articles when pushed transversely, said gripping means pivoting to a second position for simultaneously releasing the articles; and

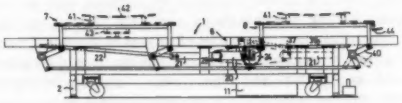
driving means drivingly connected to said gripping means for driving said gripping means together with said grasped articles in a direction transverse relative to said first conveyor, said driving means driving said gripping means between a first station adjacent to said first conveyor and a second station adjacent to a second conveyor disposed transversely relative to said first conveyor, said driving means driving said gripping means at substantially the same speed as the speed of said second conveyor such that toppling of the articles is inhibited when the articles are released from said gripping means at said second station.

4,538,721

CONVEYOR

Jan-Erik Westman, Sölvesborg, Sweden, assignor to AB Volvo, Gothenburg, Sweden

PCT No. PCT/SE82/00121, § 371 Date Dec. 9, 1982, § 102(e) Date Dec. 9, 1982, PCT Pub. No. WO82/03589, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 13, 1982, Ser. No. 453,861
Claims priority, application Sweden, Apr. 13, 1981, 8102364
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—774 **7 Claims**



1. In a conveyor, in which a driven conveyor means (3) is movable essentially in a horizontal plane between two spaced, driven support means (7,8) movable in synchronization with

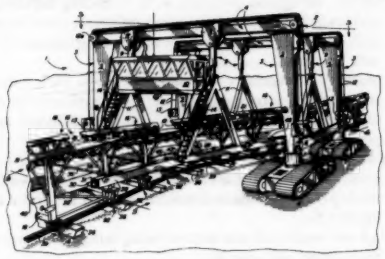
the movement of said conveyor means, said support means being arranged, prior to and after, respectively, the conveyance of an object (42) by means of the conveyor means (3), to fix said object in a stationary starting position and in a stationary end position respectively, the conveyor means (3) being of reciprocating type, the support means (7,8) being movable essentially vertically to lower objects onto and lift objects up from the conveyor means; the improvement in which the conveyor means and the support means have a common drive motor (9) with a mechanical driven train, the movements of the conveyor means and of the support means being synchronized with each other so that the conveyor means interrupts its movement while the support means move, the conveyor means (3) comprising a carriage movable in a frame (2) and coupled to said drive motor (9) via said driven train which includes a crank mechanism (12,19) in which a first crank (12) connected to the drive motor (9) engages a guide (13), movably mounted in the frame and actuating the carriage, said guide being arranged to be at rest during a portion of the rotational cycle of the first crank (12), and support means (7,8) that assume, during the movement of the conveyor means (3) from the starting position to the end position, a bottom, lowered position, and during the return movement of the conveyor means an upper, raised position, the reciprocal movement of the support means (7,8) between the raised and lowered position being controlled by a cam (35) rotating synchronously with the first crank (12).

4,538,722

CONVEYOR SHIFTING APPARATUS AND PROCESS

Maurice N. Sumner, Houston, Tex., assignor to McNally Pittsburg, Inc., Pittsburg, Kans.

Filed Mar. 30, 1983, Ser. No. 480,510
Int. Cl.³ B65G *41/00*
U.S. Cl. 198—861.2 **7 Claims**



3. A method for shifting a shiftable conveyor provided with rails mounted on rail sleepers from a first linear alignment to a second linear alignment, comprising:

(a) positioning a first set of shifting beams connected in end-to-end, articulated relationship and carrying a first plurality of rail engaging means, on one side of the conveyor over a first one of the rails;

(b) positioning a second set of shifting beams connected in end-to-end, articulated relationship and carrying a second plurality of rail engaging means, on the opposite side of the conveyor over the second one of the rails;

(c) attaching said first plurality of rail engaging means to the first one of the rails, and said second plurality of rail-engaging means to the second one of the rails;

(d) raising said first and second set of shifting beams and said first and second plurality of rail-engaging means to a selected height whereby the rails and rail sleepers beneath said first and second set of shifting beams are lifted from the ground; and

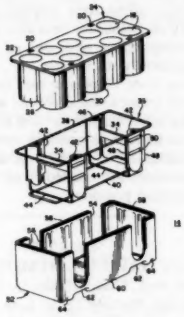
(e) urging said first and second set of shifting beams and said first and second plurality of rail-engaging means along the rails in a path conforming to said second linear alignment.

4,538,723

BATTLEFIELD MAGAZINE

Bruce S. Johnson, and Paul H. Borst, both of Dallastown, Pa., assignors to Harsco Corporation, York, Pa.

Filed Aug. 22, 1984, Ser. No. 643,189
Int. Cl.³ F42B *37/00*
U.S. Cl. 206—3 **27 Claims**



1. An apparatus comprising a projectile locking front including:

(a) a body having a front and a back;

(b) a plurality of projectile front storage zones in said body and extending from said back to said front, each of said front storage zones having an open back to allow projectiles to extend outwardly therefrom and an open front to allow projectiles to extend outwardly therefrom;

(c) locking means mounted to said body and selectively operable to secure projectiles against movement out the front of said storage zones and selectively operable to allow projectile removal out of the front of said front storage zones; and

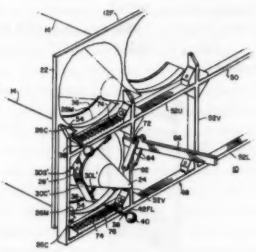
(d) base securing means on said body operable for removably securing a base to said back of said body, the base having a plurality of projectile back storage zones associated on a one-to-one basis with said front storage zones and operable to hold the backs of projectiles which have their noses extending into said projectile front storage zones.

4,538,724

SPIRAL BAND LOCKING MECHANISM

Bruce S. Johnson, Dallastown, Pa., assignor to Harsco Corporation, York, Pa.

Filed Aug. 22, 1984, Ser. No. 643,269
Int. Cl.³ F42B *37/00*
U.S. Cl. 206—3 **40 Claims**



1. An apparatus for securely holding projectiles comprising:

(a) an assembly body having a front, a back, and a plurality of projectile storage zones extending from said back to

said front, each of said zones being open at its front and operable to hold at least part of a projectile with the nose of the projectile freely accessible;

(b) a plurality of securing portions, each securing portion corresponding to one of said zones, and disposable in:

I. a securing position to prevent movement of a projectile out of said corresponding zone through said front; and

II. a release position to allow removal of a projectile out of the corresponding zone through said front;

(c) a plurality of manually operable controllers, each controller corresponding with one of said securing portions and independently disposable in:

I. a securing state disposing said corresponding securing portion in its securing position; and

II. a release state disposing said corresponding securing portion in its release position; and

(d) a gang control disposable in a securing state wherein said securing portions are moved from their release positions to their securing positions.

4,538,725

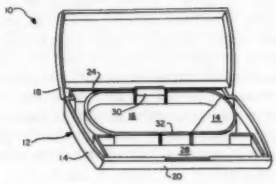
COMPACT HAVING A REMOVABLE GODET

Loren J. Glover, Roy, Utah; Milton O. Flower, Van Nuys, and David J. Pinassi, Beverly Hills, both of Calif., assignors to Max Factor & Co., Hollywood, Calif.

Filed Jul. 9, 1984, Ser. No. 628,786

Int. Cl.³ A45C *11/00;* **B65D** *25/02, 77/26*

U.S. Cl. 206—37 **4 Claims**



1. A compact, comprising: a housing including an integrally formed, one piece plastic base defining an area to receive and contain a removable godet; a godet configured to removably fit within said area; a plastic tab formed as an integral part of said base so as to be movable between a biased first position for engaging and retaining said godet within said receiving area and a second forced position for allowing the removal of said godet within said receiving area; and means for preventing said tab from moving beyond said second position in the direction away from said first position, whereby to prevent said tab from inadvertantly being bent to its breaking point.

4,538,726

DISPOSABLE MIXING PALETTE AND CONTAINER

Charles S. Pastva, 205 Millwood Dr., Apt. 202Y, Nashville, Davidson County, Tenn. 37217

Filed Jun. 15, 1984, Ser. No. 621,153

Int. Cl.³ B65D *5/72, 83/08*

U.S. Cl. 206—44.12 **8 Claims**

1. As an article of manufacture the combination of a prefabricated disposable palette having rounded or angled corners, a thumb hole for removal and holding, and either one or two usable sides stacked in multiple numbers in a cubical or rectangular shaped disposable container consisting of a front, back, two sides, a top with mounting flange containing mounting eyelets to prevent horizontal, vertical and rotational movement of said container, and a bottom with perforated or prefabricated opening to allow removal and use of individual palettes as required.

4,538,727

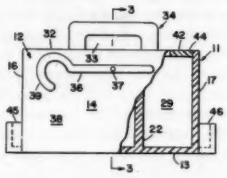
NON-COLLAPSIBLE CARRYING KIT

James H. Solloway, 11 Dwight Ave., Salem, N.H. 03079

Filed May 16, 1984, Ser. No. 610,335

Int. Cl.³ B65D *85/00, 1/36;* **A47F** *5/08;* **A47H** *1/16*

U.S. Cl. 206—223 **5 Claims**



1. A carrying kit for a plurality of articles of varying size, shape, and dimensions said kit comprising:

a rigid, non-collapsible container of generally cubical configuration having a bottom wall, a pair of elongated side walls, and a pair of shorter end walls upstanding from said bottom wall.

a central, elongated partition wall, extending between said end walls and upstanding from said bottom wall to divide said container into two opposite compartments of equal area in plan;

a plurality of shorter cross partition walls, each extending transversely across one of said compartments to divide said compartments into cells, some of different area in plan;

said central partition wall having an upper integral portion extending above the level of said side walls, end walls, and cross partition walls and being apertured to form a carrying handle;

all of said walls and said bottom being integral to form a one piece, rigid carrying kit;

and an elongated hook, pivotally mounted on one of said walls and movable from a down position below the level of the top of said side and end walls to an up position, with the hook extending above the level of said upper portion of said central partition wall for suspending said kit on a shower head pipe or shower curtain rod.

4,538,728

GOLF BAG SECURITY DEVICE

Elmer R. Lewis, 1878 E. Calaveras St., Altadena, Calif. 91001

Filed Oct. 22, 1984, Ser. No. 663,356

Int. Cl.³ A63B *55/00*

U.S. Cl. 206—315.3 **5 Claims**

1. A security device adapted for combination with a golf club bag, said golf club bag having a main tubular portion and a mouth portion forming an opening in said bag for receiving golf clubs, said device comprising in combination:

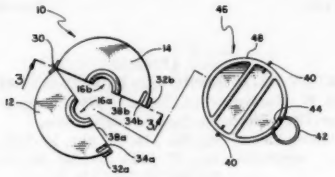
(a) a main body having first and second portions hingedly connected with each other, said hinged portions comprising symmetrically matching semi-circular shell members having corresponding mating surfaces across their diametrical chords;

(b) means for releasably locking said mating surfaces of said

first and second body portions in a position adjacent to each other;

(c) each of said shell members having a surface defining a central recess in said mating surface at the center of said chords, adapted to receive the shafts of said golf clubs;

(d) first and second retaining members on said first and



second shell members, respectively, located adjacent to said central recesses of said shell members, for retaining said golf clubs in a central opening formed by said central recesses when said mating surfaces are locked in said position adjacent to each other; and

(e) means for mounting said body to said mouth portion of said golf club bag.

4,538,729

RECORDING MEDIA STORAGE APPARATUS AND TECHNIQUE

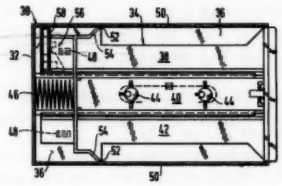
Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Chur, Switzerland

Filed Aug. 28, 1984, Ser. No. 645,068

Claims priority, application European Pat. Off., Aug. 29, 1983, 83108472.8

Int. Cl.³ B65D *85/672*

U.S. Cl. 206—387 **36 Claims**



1. Recording media storage apparatus comprising:

housing means;

transport slider means for accommodating recording media, said slider means being movable along a linear path for conveying the recording media from a storage position in which it is completely enclosed in said housing means and a removal position in which it is accessible for removal from said slider means;

spring means for biasing said transport slider means toward the removal position; and

locking means for retaining said transport slider means in the storage position against the bias of said spring means, said locking means including cooperating locking elements on said housing means and said slider means which are responsive to movement of said slider means in a first direction to alternately lock and unlock said locking means, said locking elements comprising:

at least first coupling means, said coupling means including a first movable coupling member, said coupling member being supported along the path of movement of said transport slider means; and

cam means, said cam means being supported in the direction of movement of said transport slider means and cooperating with said coupling means coupling member to establish a locked position of said transport slider means, said coupling member and cam means being movable relative to one another and being urged together in a second direction opposite to said first direction of motion of said slider means by said spring means when said locking means is in the locked position, said cam means being shaped to cause disengagement of said coupling means and said cam means upon movement of said transport slider means in said first direction when said locking means is in the locked condition.

4,538,730

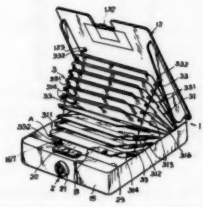
COLLAPSIBLE STORAGE BOX FOR FLOPPY DISK

Chyi-Ying Wu, P.O. Box 10160, Taipei, Taiwan

Filed May 18, 1984, Ser. No. 611,885

Int. Cl.³ B65D *85/30*

U.S. Cl. 206—444 **2 Claims**



1. A collapsible storage box for floppy disk comprising:

a casing having an upper cover and a bottom case, said upper cover pivotedly mounted on a rear wall plate of said bottom case by a hinge and normally restored to an opening position by a plurality of restored springs jacketed on a pin of said hinge;

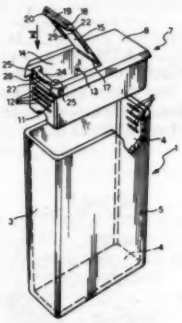
a switch means including a lock fixed on a front wall plate of said bottom case, a push-button lowerly formed with two side pins pivotedly fixed on two brackets formed on the front portion of a bottom plate of said bottom case, and a partition plate defining said lock within a compartment among said front wall plate, said bottom plate and said partition plate within said bottom case to project said push-button outwards, said push-button formed with a lip hole on its upper portion which is engaged with an extension lip formed on a front edge of said upper cover when closing said upper cover on said bottom case; and a collapsible storing means including a plurality of collapsible storage bags each formed by binding an upper transparent film with a lower base plate for storing a floppy disk therein, each said bag being terminated with a pin which is pivotedly fixed in two pin holes respectively formed on two triangle supporting plates disposed on both sides of said bottom plate, a plurality of said pin holes being slopingly formed on the slope side of said triangle supporting plate, each said bag formed with two side-wing portions on its both sides and each side-wing portion formed with a big hole and a small hole communicated with said big hole by a slit cut therebetween, two wires each tensioned by two tension springs respectively connected to said upper cover and said bottom plate and each wire formed with a plurality of balls each divided in an equal distance, said wire fixed with said balls passing through said big holes formed on said side-wing portions and said wire then moved from each said slit to pass through said small hole to allow each said ball slidingly backing each said bag to extend all said bags as a sector shape for easier withdrawal or storing of floppy disk when opening said upper cover and pulling said wires.

4,538,731

CONTAINER FOR SMALL OBJECTS, PARTICULARLY PASTILLES AND SIMILAR CONFECTIONERY PRODUCTS

Lorenzo Cillario, Alba, Italy, assignor to Ferrero S.p.A., Alba, Italy

Filed May 8, 1984, Ser. No. 608,094
Claims priority, application Italy, Jun. 30, 1983, 53532/83[U]
Int. Cl.[3] B65D *85/60, 43/16*
U.S. Cl. 206—540 1 Claim



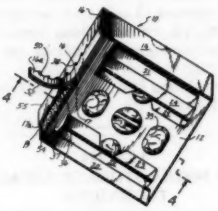
1. A container of the type having a hollow body having substantially the form of a right prism and including a rectangular base wall and two pairs of lateral walls of equal length which project from opposing sides of the base wall and define an entry opening into said body at their edges opposite the base wall, and a hollow, plastic closure element, the closure element including: a rectangular end surface of the closure element with dimensions corresponding substantially to the external perimeter of the edges of said lateral walls defining said entry opening; a skirt extending perpendicularly from said end and having, for a certain distance from said end, dimensions that it can be inserted into said hollow body and grip resiliently the internal surfaces of said lateral walls adjacent said entry opening in the assembled condition of a container, a rectangular aperture defined by said end and having a major axis coincident with the major axis of said end, said aperture being closable by a closure flap, said aperture extending from one of the minor sides of said flap for said aperture, said closure flap including a plate with flat parallel faces which is hingedly connected to said end of said aperture opposite said minor side about an axis parallel to the latter by an integral hinge constituted by a reduced section portion of the flap, said flap being of a length such that a terminal portion of its free end extends axially beyond said minor side and acts as a gripping tab when said flap is closed, and cooperating snap-engagement means formed on said terminal portion of said flap and on the minor wall of said skirt beneath the external end of said aperture, said snap-engagement means being of improved construction and comprising: a transverse projection heel formed parallel to said hinge axis, on the surface of the said projection facing towards the hinge of said closure flap, and a transverse groove having a section complementary to that of said heel and snap-engageable thereby formed in the external surface of said minor wall of the skirt, a frontal edge on side minor wall of the said front edge defining the top of said groove and said frontal edge having a central part which projects outwardly relative to its lateral parts; said lateral parts being set back slightly with respect to the external surface of said minor wall of the skirt, and being coplanar with the external surface of said minor wall; said closure flap having a smaller thickness than the end surface of said closure element, and two laterally-spaced, longitudinal ribs provided on a lower surface of said closure flap which extend from a zone of said flap spaced from said integral hinge to said heel; the length of said ribs being such that they extend from a zone spaced from said hinge.

4,538,732

CARTON WITH IMPROVED OPENING STRUCTURE

Morris W. Kuchenbecker, Neenah, Wis., assignor to James River/Dixie-Northern, Inc., Norwalk, Conn.

Continuation of Ser. No. 274,790, Jun. 18, 1981,. This application Apr. 27, 1983, Ser. No. 489,131
Int. Cl.[3] B65D *5/70*
U.S. Cl. 206—613 6 Claims



1. In a carton structure formed from paperboard characterized by inclusion of a relatively narrow wall portion to be opened in a controlled and predictable manner by tearing, the combination comprising:

relatively narrow inner and outer flaps folded in overlying relation and adhered to one another along their lengths in formation of said wall portion;

means defining a first cut score line along which said inner flap is folded to form an outside facing edge of the set up carton;

means defining a second cut score line in said inner flap parallel to and intermediate said first cut score line and the free edge of said inner flap;

said inner flap having a first upper surface portion bounded by said first and second cut score lines, a second upper surface portion bounded by said second cut score line and said free edge of said inner flap, said inner flap having a lower surface portion on the side opposite said first and second upper surface portions; the first upper surface portion of the inner flap being separable from the lower surface portion of the inner flap by delamination; and

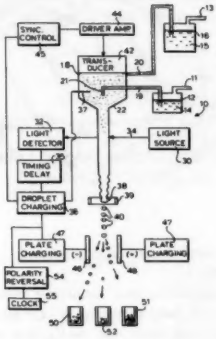
means defining a line of weakness in said outer flap coincident with and overlying said second cut score line, the recited adherence of said flaps to one another being in the region of the first upper surface portion between said cut score lines on said inner flap and between said line of weakness and the free edge of said outer flap;

said outer flap being graspable at one end thereof in a region between said line of weakness and the corresponding free edge portion, and adapted to be pulled away from the lower surface portion and the second surface portion of the underlying inner flap to effect separation of the first upper surface of the inner flap from the second surface portion along the second cut score line and from the lower surface portion between the first and second cut score lines by delamination, the first surface portion of the inner flap remaining adhered to the outer flap during the delamination of the inner flap between said cut score lines, said first cut score line for facilitating said delamination of said inner flap, whereby said carton is opened.

4,538,733
PARTICLE SORTER WITH NEUTRALIZED COLLECTION WELLS AND METHOD OF USING SAME

Michael A. Hoffman, Sunnyvale, Calif., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Oct. 14, 1983, Ser. No. 542,285
Int. Cl.³ B07C 5/342
U.S. Cl. 209—3.1 **19 Claims**



1. An apparatus for sorting particles moving in a liquid stream according to differences in particle parameters comprising:

means for providing a continuous liquid stream containing particles therein;

detector means for detecting particles in the stream;

means for modulating the flowing liquid stream to disrupt its continuous flow and cause discrete particle-containing droplets to be formed;

droplet charging means responsive to the detector means for electrically charging selected droplets;

electrical deflecting means for deflecting charged droplets to separate same from uncharged or oppositely charged droplets; and

means for simultaneously and periodically reversing the respective polarities of the droplet charging means and the electrical deflecting means whereby particles of the same selective interest, some of which have opposite electrical charges thereon, are collectible in a collection well inside which the electrical charge is substantially neutralized.

4,538,734
DISK SCREEN APPARATUS, DISK ASSEMBLIES AND METHOD

Michael L. Gill, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jul. 14, 1983, Ser. No. 513,761
Int. Cl.³ B07B 13/04
U.S. Cl. 209—668 **20 Claims**

1. A disk screen apparatus comprising a screening bed having a series of corotating spaced parallel elongate disk assemblies each of which has a longitudinal series of concentric screen disks which interdigitate in axially spaced relation with the screen disks on the adjacent disk assemblies, and comprising:

each of said disk assemblies having an elongate shaft provided with means at opposite ends for rotatably mounting the assembly in the disk screen apparatus;

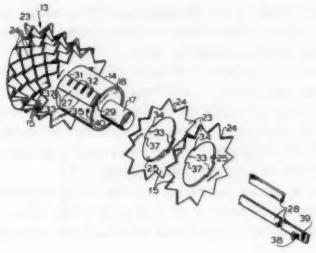
an elongate indexing and keying structure extending longitudinally along and permanently rigid with the perimeter of said shaft and providing a longitudinally extending and circumferentially facing edge;

said edge having a series of longitudinally spaced circumferentially extending indexing and keying notches therein for determining the positions of the disks relative to one another along the length of the shaft;

said screen disks being annular and mounted on said shaft and having inner diameters which engage said shaft perimeter;

key means on said inner diameters engageable in said notches;

each of said disks being movable along the length of said



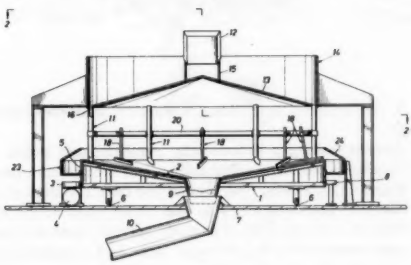
shaft by sliding its inner diameter along said perimeter and with said key means freely movable along said edge until aligned with a selected notch, and the key means being then assembled in the aligned notch by relative rotation of the disk and shaft;

and means for locking said disks in their selected positions with said key means in said notches and thereby retaining said disks spaced from one another in accordance with said notches and corotative with said shaft.

4,538,735
APPARATUS FOR SEPARATING SOLIDS OF DIFFERENT SHAPES

Johannes Boom; Teunis Terlouw, both of Amsterdam, Netherlands, and Pieter Visser, deceased, late of Oegstgeest, Netherlands (by Antonia Jacoba Visser, née Van der Heide, legal representative), assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 14, 1982, Ser. No. 417,930
Claims priority, application United Kingdom, Sep. 23, 1981, 8128776
Int. Cl.³ B07C 5/34
U.S. Cl. 209—691 **7 Claims**



1. An apparatus for separating spherically-shaped solids from irregularly-shaped solids comprising:

a substantially horizontal separating table, said separating table having a frustoconical upper surface extending in a downwardly direction towards the center, the angle of said upper surface being at least as great as the roll angle of said spherically-shaped solids and less than the slide angle of the irregularly-shaped solids, said table in addition being mounted for rotation about its vertical axis;

a central vertical conduit, said conduit communicating with a central opening in said separating table for removing the spherically-shaped solids from the apparatus;

a supply means, said supply means being non-rotatively mounted above said separating table and including an open top cylindrical box structure mounted above said separating table, the lower wall of the box structure having a conical shape extending in an upward direction towards the center and having a slope greater than the slide angle of the irregularly-shaped solids and the outer periphery of the box structure being adjacent the outer edge of the separating table;

means for supplying a mixture of spherically- and irregularly-shaped solids to said box structure;

a plurality of supply tubes, said supply tubes being mounted at the periphery of the box structure whereby said solids will flow by gravity from said supply means to the outer portion of said separating table; and

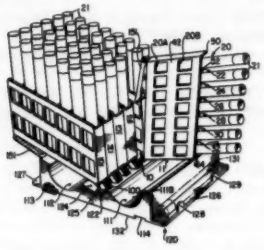
removal means for removing the irregularly-shaped solids from the periphery of said separating table, said removable means being spaced intermediate said supply tubes.

4,538,736

MARKER STORAGE CASSETTE AND HOLDERS THEREFOR

Barry D. Berger, Brooklyn, N.Y., assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Jul. 12, 1983, Ser. No. 512,965
Int. Cl.³ A47F 7/00
U.S. Cl. 211—69.5 **40 Claims**



1. An apparatus for holding a plurality of articles comprising:

a cassette having a substantially parallelepiped shape, said parallelepiped having first and second substantially parallel major faces, at least first, second and third rectangular sides disposed perpendicularly to said major faces at the edges thereof, and a plurality of partially open elongate receptacles positioned parallel to said major faces, said receptacles being adjacent to each other along said major faces,

means for rotating said cassettes about an axis adjacent and parallel to said major faces of said cassette; and

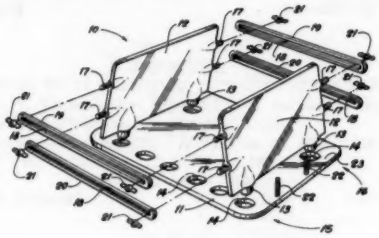
means for pivoting said cassette about an axis adjacent to a corner of said parallepiped and substantially perpendicular to the planes of said major faces, said pivoting means comprising a tab extending from a corner of said cassette, said corner being defined by said first and second sides, said tab cooperating with a recess for rotatably pivoting about an axis adjacent to said corner and perpendicular to the plane of said cassette major face.

4,538,737

ADJUSTABLE PACKAGE CARRIER

Samuel T. Delaney, 3400 Nantucket Dr., Lexington, Ky. 40502

Filed Jun. 1, 1983, Ser. No. 499,858
Int. Cl.³ A47G 29/00; B65D 6/26
U.S. Cl. 211—71 **8 Claims**



1. An adjustable article carrier, comprising

a pair of side walls;

a substantially continuous base including means for receiving said side walls, said receiving means allowing pivotal adjustment between said side walls and said base and adjustment of the distance between said side walls toward and away from each other along substantially the full length of said base;

cross members for connecting said side walls at side edges thereof; and

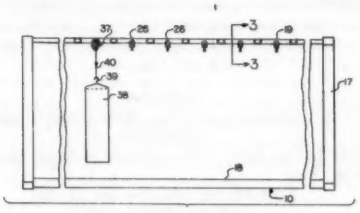
means for securing the position of said side walls along said cross members to clamp articles together, thereby providing support and security to hold articles of various shapes and sizes on said base.

4,538,738

REMOVABLE GARMENT RACK FOR TRANSPORT OF HANGING GARMENTS

Willem H. P. Van Iperen, Westfield, N.J., assignor to Sea-Land Corporation, Elizabeth, N.J.

Filed Jun. 20, 1983, Ser. No. 505,689
Int. Cl.³ A47F 7/24
U.S. Cl. 211—162 **11 Claims**



1. A modular and stackable cargo container having a removable garment rack for transportation of hanging garments,

(a) a modular and stackable cargo container having a reinforced floor and corner posts, at least one door, said walls and a roof to define an enclosed container,

(b) a pair of inwardly extending longitudinal ledges adjacent the roof and extending inwardly from a pair of opposing side walls,

(c) a pair of overhead guide rails extending between said corner posts for supporting said longitudinal ledges and said roof,

(d) a plurality of removable and adjustable garment rails having first and second end sections, said rails being spaced apart and extending traversely across said container between said pair of inwardly extending ledges,

each of said end sections having a slot therein for engaging the longitudinal ledge,

(e) a releasable securing means mounted at each of said end sections to releasably secure said garment rails to said ledges,

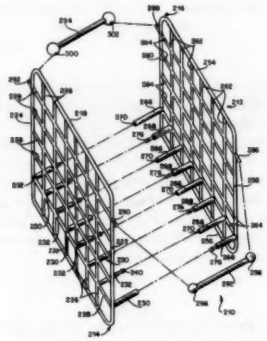
whereby said garment rails may be traversely and adjustably spaced along the longitudinal dimension of said container to maximize the number of hanging garments when transporting garments; and quickly and easily removed to allow the entire cross section of the container to be filled with bulk goods.

4,538,739

MAGAZINE RACK

Yaffa Licari, and Vito Licari, both of 875 Ocean Ave., Elberon, N.J. 07740

Filed Nov. 24, 1982, Ser. No. 444,081
Int. Cl.³ A47F 7/00
U.S. Cl. 211—189 **5 Claims**



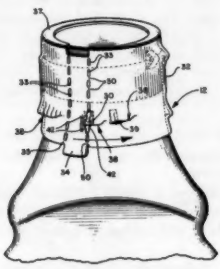
1. In a magazine rack which includes a body having a pair of side members and a bottom member extending between the side members, the improvement comprising first connecting means formed monolithically with one of said side members, said one side member including a generally planar portion and a plurality of elongated elements extending outwardly from said planar portion of said one side member at spaced intervals therealong, said first connecting means including a plurality of male connectors, each male connector being formed monolithically with a corresponding one of said elongated elements of said one side member, and a plurality of female connectors, each female connector being formed monolithically with a corresponding one of said elongated elements of said one side member, and second connecting means formed monolithically with the other side member, said other side member including a generally planar portion and a plurality of elongated elements extending outwardly from said planar portion of said other side member at spaced intervals therealong, said second connecting means including a plurality of male connectors, each male connector being formed monolithically with a corresponding one of said elongated elements of said other side member, and a plurality of female connectors, each female connector being formed monolithically with a corresponding one of said elongated elements of said other side member, said male connectors of said one side member mating in a snap fit with said female connectors of said other side member and said female connectors of said one side member mating in a snap fit with said male connectors of said other side member such that said planar portion of said one side member defines one side of said rack, said planar portion of said other side member defines an opposite side of said rack, and said elongated elements of said one side member cooperate with said elongated elements of said other side member to define said bottom member of said rack.

4,538,740

TAMPER RESISTANT CLOSURE

Benjamin R. Petersen, Jr., Wheaton, Ill., assignor to Fantasy Flavors, Inc., Wheaton, Ill.

Filed Dec. 27, 1983, Ser. No. 565,976
Int. Cl.³ B65D 49/12
U.S. Cl. 215—246 **20 Claims**



1. A tamper resistant closure system, comprising:

a container having a neck and a mouth defining an opening, the mouth having threading for engaging a screwable cap;

at least one tooth projecting radially from said neck, said projecting tooth having a width which is narrow with respect to the circumference of said neck;

a screwable cap having threading for mating with the threading on the neck for capturing said cap in sealing relation to said mouth;

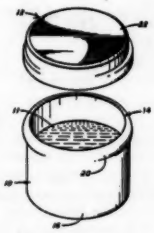
a shrinkable plastic sleeve having at least one area of relative mechanical weakness, said sleeve tightly shrunk to engage said cap and said neck, and said area of relative weakness positioned on said neck such that when said cap is twisted in an opening direction, said sleeve and said area of relative weakness will twist toward said at least one tooth and said at least one tooth will tear a portion of the sleeve proximate to said area of relative weakness to provide evidence of tampering.

4,538,741

CONTAINER AND LID

Stanley A. Jacobs, P.O. Box 1979, New Haven, Conn. 06509

Continuation-in-part of Ser. No. 379,746, May 19, 1982, abandoned. This application Nov. 2, 1983, Ser. No. 547,907
Int. Cl.³ B65D 41/18
U.S. Cl. 215—320 **13 Claims**



1. A lid for a container having a sidewall, a mouth disposed at the upper end of the sidewall, and a lip extending about the periphery of the container mouth, said lid comprising:

a top wall;

a relatively thin resilient sidewall web segment depending downwardly from said top wall and being stretchable heightwise and expandable radially; and

a skirt integral with an extending downwardly from the lower edges of said web segment, said skirt being thicker than said web segment and displaying a greater resistance

to radial and heightwise expansion and greater elastic memory than said web segment;

the inner diameter of said web segment being no more than the inner diameter of said skirt, the inner surfaces of said skirt and said web segment forming a continuous and uninterrupted inner sidewall surface;

said web segment being stretchable heightwise to enable it to wrap snugly and sealingly around the outer surface of said container lip when said lid is applied to said container, said skirt being constructed to retain the stretched web segment in sealing engagement with said container lip when said lid is applied to said container mouth with said skirt against said container sidewall.

2. A lid as defined in claim 1 wherein the inner diameter of said skirt is substantially equal to the outer diameter of said container sidewall.

3. A lid as defined in claim 2 formed from low to medium density polyethylene, said web segment being of the order of 0.015 inches thick and said skirt being of at least 0.06 inches thick.

4. A lid as defined in claim 1 wherein said lid further comprises a sealing ring molded integrally with and depending from the underside of said lid, said sealing ring being dimensioned to seat against an interior surface of said container mouth.

5. A lid as defined in claim 1 wherein said inner sidewall surface is a generally cylindrical surface.

6. A lid as defined in claim 5 wherein said inner sidewall surface is a right cylindrical surface.

4,538,742

PLASTIC BOTTLE CASE AND BOTTLE PACKAGING WITH SUCH CASE

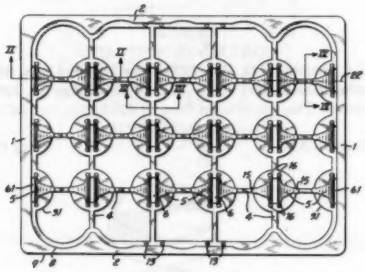
Ulrich H. Prodel, 13 Gruenstr., Badsalzulften, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,303

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218075

Int. Cl.³ B65D *1/24*

U.S. Cl. 220—21 **15 Claims**



1. A rectangular plastic bottle case for individual bottles and bottles in bottle carrier of sheet material, comprising end walls, side walls, a bottom and means for positioning bottles in the case with the bottles closely spaced in straight lines parallel to the end walls, said bottle positioning means comprising columns projecting up from the bottom of the case, said columns being arranged in straight rows of pairs of columns, the two columns of each pair being spaced from one another to provide between them aligned spaces to receive a side of a bottle carrier, said columns being open V-shaped in cross-section, each of said columns being formed of two sides integrally joined with one another in an acute angle having its apex directed away from the space between the two columns of a pair, each side being bent inwardly along a longitudinal median line to provide two integral elongate wall portions disposed at an obtuse angle to one another, each column having three corners of which two are at edges of said sides adjacent said space between the two columns of a pair and one is at the apex of the acute angle in which the two sides join, and an enlarged rounded bead at each of said corners imparting strength to said columns and adapted to engage and precisely position bottles in said case.

4,538,743

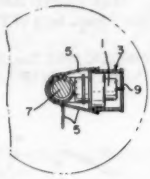
SAFETY COVER FOR AUXILIARY BRAKE OPERATING CASING

Melvin E. Piper, and May P. Piper, both of Box 54, Hollidaysburg, Pa. 16648

Filed Oct. 29, 1984, Ser. No. 665,755

Int. Cl.³ B65D *55/16*

U.S. Cl. 220—375 **2 Claims**



1. In a wheeled vehicle provided with standard wheel braking means including a central fluid pressure system for operating the braking means and provided with auxiliary brake operating mechanism subject to the same air pressure as the standard brake operating means and mounted on the vehicle adjacent a wheel to be braked and comprising a cylindrical casing containing the auxiliary brake operating mechanism including compressed air; a removable safety cover about said casing and means for releasably securing said cover member to the vehicle while in place about said casing.

4,538,744

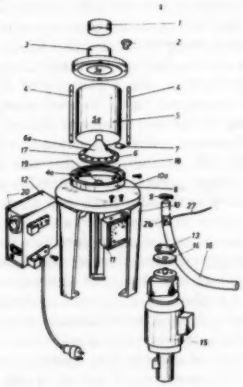
DEVICE FOR SUPPLYING MATERIAL WITH UNIT DOSES OF PARASITICIDAL COMPOSITION

Jorg Weissenborn, 6941 Laudenbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 211,993, Dec. 1, 1980, abandoned, which is a continuation of Ser. No. 48,126, Jun. 13, 1979, abandoned. This application Feb. 16, 1982, Ser. No. 349,399

Int. Cl.³ G01F *11/10*

U.S. Cl. 222—36 **7 Claims**



1. A device for supplying unit doses of particulate parasiticidal composition to material susceptible to parasite attack, comprising, in combination:

(1) a supply of particulate parasiticidal composition;

(2) means for gravity-feeding unit doses in regular sequence at timed intervals from the supply of the material;

(3) means for sensing each unit dose as fed to the material comprising a capacitive approach switch which gives a pulse whenever a body passes the switch, and which is in operative connection with a monostable sweep circuit, and a counter in operative connection with said capacitive approach switch, counting the pulses emitted by the capacitive approach switch, and keeping a tally of the total;

(4) means in the monostable sweep circuit for timing the interval between unit doses, and emitting a signal whenever the time interval between two succeeding pulses exceeds a predetermined interval of time; and

(5) means controlled by said signal for giving an alarm indicating that the time interval between two succeeding pulses exceeds said predetermined interval of time.

4,538,745

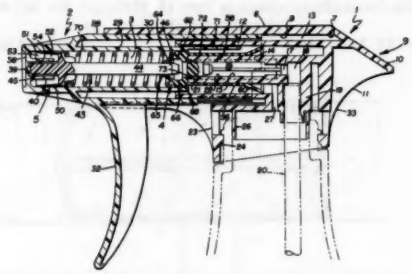
TRIGGER SPRAYER

Walter B. Dunning, Pleasanton, Calif., and Robert L. Bundschuh, Miami Lakes, Fla., assignors to The Clorox Company, Oakland, Calif.

Filed May 19, 1983, Ser. No. 496,330

Int. Cl.³ B67B *5/00*

U.S. Cl. 222—153 **14 Claims**



1. A trigger sprayer for manually dispensing fluid from a container comprising a housing and an actuator reciprocally slidable within the housing, said housing and said actuator including means for providing a pump chamber therein, inlet passageway for connecting fluid from a container to the pump chamber provided in said housing, outlet passageway for allowing exit of fluid from the pump chamber, provided in said actuator, inlet valve means for controlling flow of fluid from the inlet passage to the pump chamber, outlet valve means for controlling fluid flow through said exit passage, shipping seal means for sealing said inlet passageway, and unsealing means for unsealing the shipping seal means upon reciprocation of the actuator into the housing.

4,538,746

KEG-TAPPING ASSEMBLY

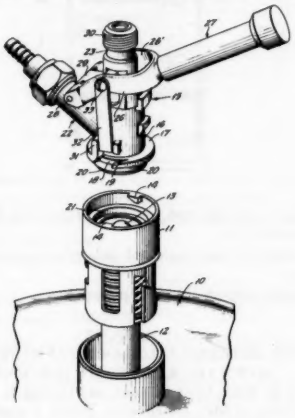
James H. Hines, Glenwood, N.J., assignor to Vending Components, Inc., Hackensack, N.J.

Filed Jun. 29, 1983, Ser. No. 508,930

Int. Cl.³ B65D *83/00*

U.S. Cl. 222—153 **5 Claims**

1. In a keg-tapping assembly for adapting a keg for the safe pressurized dispensing of beverage contents, wherein the keg has an annular neck with inwardly directed bayonet-locking lug formations and a central check-valve member resiliently upwardly loaded to closed position and exposed via said neck for downward valve-opening actuation, and wherein the tapping comprises an upstanding annular body with outwardly directed bayonet-slot formations in a flange at its lower end engageable with keg-neck lugs, whereby in the bayonent-engaged position of said keg-tapping assembly when mounted in said neck, said flange is fully axially recessed in and circumferentially enveloped by said neck, said body having a gas-pressure inlet port, a tubular valve member guided by and within said body, said valve member at its lower end when downwardly actuated permitting the check valve member to open and the valve member at its upper end permitting beverage contents to pass therethrough, and a valve-actuating handle pivoted to said body and connected for selective up-down actuation to determine (1) an opening of said check-valve member and admission of pressurized gas to the keg when said body is fitted to the keg neck and the handle is in its down position, and (2) cut-off of pressurized-gas delivery and relief from check-valve-actuating engagement when the handle is in its up position, the improvement in which said body includes an upwardly oriented guide formation at vertical offset from and in substantial angular register with one of said slot formations, and a vertically oriented rigid locking leg of substantially the width of said one slot formation and vertically displaceable



in said guide formation, an articulating pin connection between said leg and a part of said handle, said leg (3) in the down position of said handle being positioned to substantially occupy said one slot formation and to foreclose disengagement of said bayonet formations and (4) in the up position of said handle being positioned to clear the path of bayonet-lug displacement, and (5) said leg being of sufficient downward extent to interfere with the involved keg-neck lug in the event that bayonet-locking rotation of said body with respect to the keg neck has been insufficient for the lug to clear the involved slot formation, the point of such interference being prior to any opening actuation of the check valve, whereby the lower end of said locking leg is at least in partial axial overlap with said neck for all valve-opening conditions, however slight or full the extent of valve opening.

4,538,747

DISPENSER FOR THE PORTIONED DISPENSING OF, IN PARTICULAR, PASTY MASSES

Alfred von Schuckmann, Kervendonk 63, 4178 Kevelaer 2, Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,749

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1983, 3303002

Int. Cl.³ G01F *11/00*

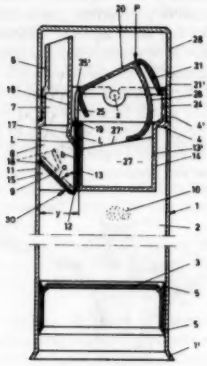
U.S. Cl. 222—260 **12 Claims**

1. In a dispenser for apportioned dispensing of material, including a dispenser housing, a mouthpiece, a storage chamber for the material, a piston arranged to travel within the storage chamber in a direction toward the mouthpiece in dependency on dispensing actuation steps, an actuating handle, a slide displaceable by said handle toward the mouthpiece, lip means arranged for sealingly guiding the slide to the housing, an ejection channel connected to the mouthpiece, and a wing arranged to come in sliding contact against a wall of said ejection channel during an actuating stroke and to move away

from the wall of the ejection channel during a return stroke, the improvement wherein:

said wing is flat,

said slide is V-shaped,



said wing forms one resiliently moveable leg of said V-shaped slide,

the vertex of said V-shaped slide points toward said piston, and

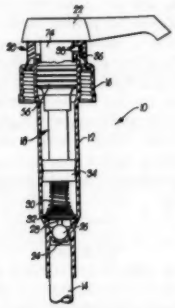
said slide extends into said material.

4,538,748

TAMPER DETERRING UNLOCKING RESTRICTER FOR DOWN LOCKING PUMP DISPENSERS

John M. B. Ford, Lee's Summit, and Donald D. Foster, Kingsville, both of Mo., assignors to Realex Corporation, Kansas City, Mo.

Filed Feb. 16, 1983, Ser. No. 466,776
Int. Cl.³ B67D *5/42*
U.S. Cl. 222—321 **7 Claims**



1. In a down-locking dispensing pump having a tubular body, an annular collar at one end of the body, a plunger reciprocable through the collar and within the body in pumping strokes between extended and depressed positions and retained against complete removal from the body, and means for releasably locking the plunger in said depressed position including a lug adjacent the outer end of said plunger which may be retained under a ledge of the collar after the plunger is first fully depressed to insert the lug into a notch in the ledge and then rotated an adequate amount in a certain direction to slip the lug under the ledge, said lug being disposed when out of axial alignment with said notch to overlie said ledge and abuttingly engage the latter during each full depression stroke of the plunger whereby to limit the extent of such depression stroke, the improvement comprising:

means defining a pair of circumferentially spaced shoulders on said collar below said ledge in position for trapping said lug therebetween when the plunger is rotated in said certain direction to one extreme of its travel as determined by the lug engaging the shoulder most circumferentially remote from said notch,

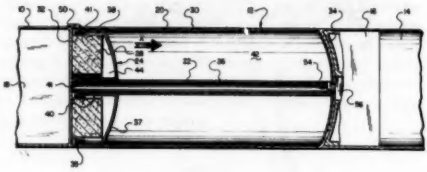
the other of said shoulders and said lug having mutually interengageable means associated therewith which are configured and arranged to permit relatively unhindered movement of the lug in said certain direction past the other shoulder and into locking position against said remote shoulder while requiring substantially increased force to thereafter release the lug from the locking position by overriding the other shoulder during rotation of the plunger in the opposite direction.

4,538,749

NON-CIRCULAR ROLLING DIAPHRAGM LIQUID EXPULSION APPARATUS

Irwin E. Rosman, Woodland Hills, and David L. Leonard, Canoga Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 282,551, Jul. 13, 1981, abandoned. This application Dec. 15, 1983, Ser. No. 562,497
Int. Cl.³ B67D *5/54*
U.S. Cl. 222—386.5 **4 Claims**



1. A missile frame having a cross-sectional shape defined by at least two different radii of curvature, wherein the capacity of said missile frame to contain a fluid is improved, said missile frame comprising a rolling diaphragm piston expulsion tank shell extending along at least a portion of the length of said missile frame and having a cross-sectional shape substantially conforming with at least a portion of said cross-sectional shape of said missile frame, said tank shell having a rolling diaphragm set adjacent to said tank shell and attached to a piston, said rolling diaphragm having local thicknesses t, all of said local thicknesses t being related by the following relationship:

$$D_R = \sqrt{R_c t} = K \text{ (constant)}$$

wherein R_c is the local cross-sectional radii of curvature of said rolling diaphragm and D_R is the rolling diameter of said rolling diaphragm, said rolling diameter being maintained at a uniform value K to assure stability in said rolling diaphragm during actuation of said piston.

4,538,750

CONVERTIBLE BED AND PACK FRAME

Kenneth V. Hanna, 445 S. Cranbrook Crossroads, Birmingham, Mich. 48010

Filed Oct. 17, 1983, Ser. No. 542,374
Int. Cl.³ A45F *4/00*
U.S. Cl. 224—156 **12 Claims**

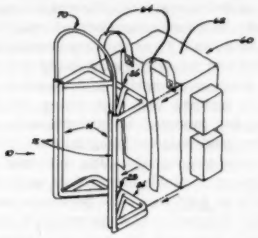
1. A convertible bed and pack frame comprising:

first and second members, each having first and second spaced side rails, each of the first and second side rails each having first and second ends;

first means depending form and interconnecting the first and second rails of the first member;

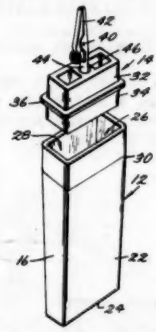
second means depending from and interconnecting the first and second side rails of the second member; and wherein

the first and second side rails of the first and second members are detachably re-arrangeable between a nested side-by-side pack carrying configuration and a co-axial bed frame



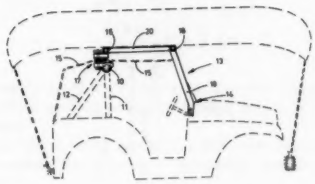
configuration in which the first ends of the first and second side rails are directly interconnected.

4,538,751
CIGARETTE CASE
Robert A. Peterson, 699 Berwood Ave., St. Paul, Minn. 55110
Filed Aug. 5, 1983, Ser. No. 520,708
Int. Cl.³ A45C *11/22*; B65D *43/08*
U.S. Cl. 224—252 **3 Claims**



1. A portable, waterproof container comprising:
an integral body, including respective sets of sidewalls and a bottom piece, defining a cavity therein having an opening at one end of said body wherein at least one said set of integral body opposing sidewalls taper inwardly from a predetermined point with respect to said opening to said bottom piece such that the cross-sectional area of said cavity is greater near said opening than near said bottom piece by a predetermined difference in cross-sectional area; and
a reversible cap including first and second end portions, each conforming to said opening and a predetermined portion of said cavity, wherein said cap first end portion includes an axially disposed bore, said bore communicates between said cap first and second portions;
an outwardly extending lip disposed about the periphery of said cap at the junction of said end portions,
said first and second end portions being adapted to be received in said opening such that said lip is adjacent to said sidewalls about the lip of said opening, said lip, sidewalls, and cap cooperating to effect a watertight seal between said cap and said body; and
alligator clip means, affixed to said first end portion and extending generally axially outward therefrom, for effecting selective fastening to an extrinsic object, said clip means being adapted to be received in said cavity when said first end portion is inserted and received in said opening, said clip means includes a haft portion adapted to be fixedly received in said bore, wherein said haft portion extends through said bore and includes a terminal portion extending outwardly from said cap second end portion, said clip means haft terminal portion includes a transverse bore therethrough.

4,538,752
TOP CARRIER FOR A CONVERTIBLE JEEP-TYPE VEHICLE
Charles J. Welter, Rte. 2, Box 163, Baldwin, Wis. 54002
Filed Sep. 19, 1984, Ser. No. 651,902
Int. Cl.³ B60R *9/00*
U.S. Cl. 224—309 **8 Claims**

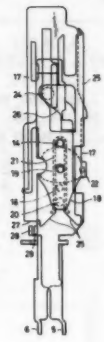


1. An overhead type rack or carrier for a jeep-type vehicle having a front windshield, a fabric top and a roll bar below the fabric top located to the rear of and extending from side to side of the vehicle, comprising:
(a) a horizontal rigid elongated rear cross bar located above the roll bar;
(b) clamp means located near each end of said rear cross bar;
(c) said clamp means comprising:
I. a rigid upper clamp member securely attached to said cross bar;
II. a lower U-bolt member for going around said roll bar;
III. resilient seal means located between said upper clamp member and said U-bolt for releasably holding the fabric cover; and
IV. means for releasably securing together said U-bolt member and said upper clamp member;
(d) a rigid elongated front cross bar paralleling and forward of said rear cross bar;
(e) vertical support rod means attached at each end of said front cross bar;
(f) means for releasably securing said vertical support rod means to said vehicle;
(g) rigid hoizontal elongated connecting bar means; and
(h) means for releasably securing said connecting bar means between said front cross bar and said rear cross bar.

4,538,753
TAPE RECORDER
Hideki Hayashi; Satoshi Takagi; Yukio Ito, and Sadayoshi Endo, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan
Filed Jul. 14, 1982, Ser. No. 398,257
Claims priority, application Japan, Jul. 16, 1981, 56-110057; Jul. 16, 1981, 56-110058; Jul. 16, 1981, 56-110059; Jul. 16, 1981, 56-110060
Int. Cl.³ G11B *15/10, 15/32, 19/02*
U.S. Cl. 226—199 **3 Claims**

1. A fast-forwarding and rewinding operating mechanism in a tape recorder having a drive mechanism for a tape reel comprising:
a fast-forward (FF) lever element having a hook-shaped guide recess;
a rewinding (REW) lever element superposed on said FF lever element and having a corresponding hook-shaped guide recess in partial overlapping relation;
an oscillating member adjacent said levers pivoted about a fixed pivot and having an oscillating portion extending through both of said guide recesses; and,
transmission means connected to said oscillating member

and moved with said oscillating member for producing a driving engagement between said drive mechanism and



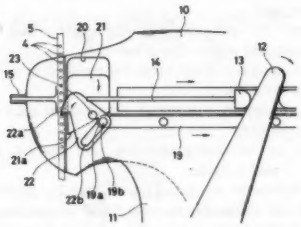
said tape reel in response to movement of one of said levers.

4,538,754

FASTENER DISPENSING DEVICE

Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Tokyo, Japan and Ben Clements & Sons, Inc., South Hackensack, N.J.

Filed Jun. 9, 1982, Ser. No. 386,502
Claims priority, application Japan, Feb. 20, 1981, 56-23181
Int. Cl.³ B65C *5/06*
U.S. Cl. 227—67 **8 Claims**



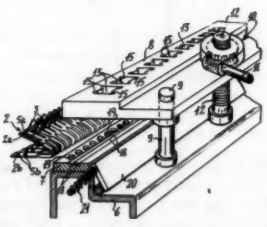
1. A fastener dispensing device for dispensing one at a time a plurality of fasteners loaded in the device in the form of an integral assembly, each fastener comprising a filament having a head and a crossbar at one and the other ends thereof and having a connection neck comprising an end portion extended beyond the cross bar at an end remote from the head, said plurality of fasteners being connected through their connection necks to a connecting bar to form said integral assembly, the device comprising a main body having a grip part and, removably mounted in a front end portion thereof, a hollow needle formed with a side slot, and further having a guide for the fastener assembly formed at a location at the rear of the hollow needle and extending in a direction perpendicular to the longitudinal axis of the needle; a lever mounted in front of the grip part of the main body in a manner capable of rocking in backward and forward directions relative to the main body a pushing rod operably coupled to the lever for displacement of the pushing rod into the hollow of the hollow needle so that individual fasteners of the fastener assembly loaded in the guide are successively dispensed one at a time with their crossbars passed through the hollow needle; the device further comprising a feeding mechanism provided in the proximity of the guide groove adapted to engage the connection necks of fasteners and, upon completion of dispensing a first fastener, to bring a second fastener to the prescribed position within the main body at the rear of the hollow needle, irrespective of a change or an irregularity with respect to the pitch of the connection necks of the fasteners on the connecting bar of the fastener assembly, said feeding mechanism comprising a movable plate driven by said lever to reciprocate in and along a further guide formed inside the main body at a side of said guide for the fastener assembly, said movable plate being formed with an inclined cam face along the lower edge thereof, a slide bar mounted to intermittently engage said inclined cam face, said slide bar being driven to reciprocate to intermittently move said movable plate to ascend and decend, and a feeder element pivotably mounted on said movable plate and formed with at least one claw part engagable with the connection necks of fasteners in a manner such that when said lever is operated it is brought into and out of contact with the connection necks, said feeder element being brought into engagement with a connection neck to feed the fastener assembly when said movable plate descends in said further guide, said feeder element being formed with a slit in which said slide bar is engaged, said claw part being rocked in a direction away from the connection necks of the fasteners when said feeder element ascends.

4,538,755

APPARATUS FOR FIXING BELT-FASTENERS OR THE LIKE

Jean-Francois Schick, Paris, France, assignor to Goro S.A., Chelles, France

Continuation of Ser. No. 364,667, Apr. 2, 1982, abandoned. This application Sep. 4, 1984, Ser. No. 647,276
Claims priority, application France, Jun. 12, 1981, 81 11588
Int. Cl.³ B25C *7/00*
U.S. Cl. 227—152 **5 Claims**



1. An apparatus for attaching to an end edge of a conveyor belt a row of fasteners having a length and including "U"-shaped elements each having upper and lower arms with free edges and holes and disposable straddlewise on the end edge of the conveyor belt, and pairs of similarly "U"-shaped staples having pointed ends, drivable through said holes of said pairs of arms of said "U"-shaped elements and projecting initially above said upper arms of said "U"-shaped elements, the apparatus comprising:

a stationary anvil having a length equal to the length of the row of fasteners to be attached, said stationary anvil having an upper surface provided with grooves in which said pointed ends of said staples engage for initial bending of said pointed ends of said staples having been previously driven through said fasteners;

a movable cover overlying and parallel to said stationary anvil, having a length equal to said length of said stationary anvil, a lower face adapted to receive said upper arms of said "U"-shaped elements of the row of fasteners, a series of apertures each of which disposed overlyingly to a respective one of said "U"-shaped elements of the row of fasteners and adapted to receive said pair of staples for attaching each of said "U"-shaped elements when the row of fasteners is preliminarily positioned against said lower

face of said movable cover, said series of apertures of said movable cover having a configuration for complementarily receiving a punch for driving said staples that were previously engaged in said apertures;

control means for moving said movable cover towards said stationary anvil and simultaneously clamping all of said "U"-shaped elements of the row of fasteners to the end edge of the conveyor belt; and

an additional hinge plate pivotable relative to said stationary anvil between an inoperative position in which it is located outside of said grooves of said stationary anvil during driving of said staples and initial bending of said pointed ends, and an operative position in which it overlies said stationary anvil and covers said grooves so as to form a flat abutment surface against which said pointed ends of said staples abut for final bending and clinching of said pointed ends.

4,538,756

PROCESS FOR PRODUCING REINFORCED STRUCTURAL MEMBERS

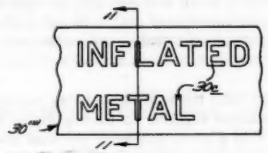
George Trenkler, East Providence, R.I., and Richard G. Delagi, Sharon, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 311,574, Oct. 15, 1981, Pat. No. 4,434,930. This application Jun. 10, 1983, Ser. No. 502,987

The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.

Int. Cl.[3] **B23K** *19/00*

U.S. Cl. 228—118 **2 Claims**



1. A process for producing a reinforced structural member comprising the steps of

providing at least two flat sheets of malleable metal, disposing a selected pattern of stop-off material between at least two adjacent sheets, the stop-off material being composed of a plurality of portions, each portion being thermally decomposable to generate a gas when raised above a predetermined temperature, the predetermined temperature being different for each portion and selected so that gas generation can be effected according to a selected temperature profile, at least part of which is selected to provide plastic flow in the sheets contiguous to the stop-off material,

squeezing and solid state bonding the sheets one to another, and

heating the sheets according to the selected temperature profile to cause gas generation and concomitant separation and plastic flow of the sheets contiguous to the stop-off material.

4,538,757

WAVE SOLDERING IN A REDUCING ATMOSPHERE

Bary R. Bertiger, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 1, 1983, Ser. No. 518,989

Int. Cl.[3] **B23K** *1/08;* **H05K** *3/34*

U.S. Cl. 228—180.1 **7 Claims**

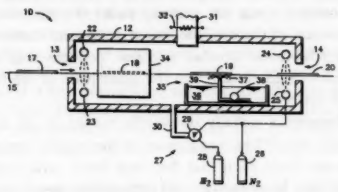
1. A wave soldering apparatus comprising:

an enclosure having an entrance and an exit;

conveyor means for carrying articles to be soldered through said enclosure, said conveyor means passing through said entrance and exit;

wave soldering means inside said enclosure for soldering said articles on said conveyor means;

atmosphere supply means coupled to said enclosure for



maintaining a reducing, non-explosive and oxygen poor atmosphere and providing a fluxing action inside said enclosure;

vent means for venting gases from said enclosure; and

burn-off means for burning a flammable portion of said gases.

4,538,758

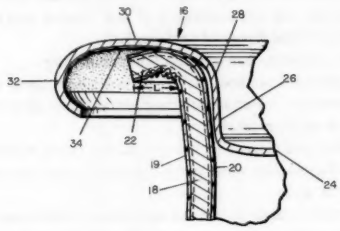
COMPOSITE CONTAINER

Edwin D. Griffith, Pemberville, Ohio, assignor to Automated Container Corporation, Orlando, Fla.

Continuation of Ser. No. 83,915, Oct. 11, 1979, abandoned, which is a continuation of Ser. No. 920,764, Jun. 30, 1978, abandoned. This application Oct. 8, 1981, Ser. No. 309,595

Int. Cl.[3] **B65D** *8/20;* **B21D** *51/30*

U.S. Cl. 229—4.5 **6 Claims**



1. A method of forming an improved, mechanically strong end closure on a plural ply composite container comprising the steps of

providing a cylindrical can body of plural ply composite material open at both its opposite axial ends, said can body comprising an inner layer, a structural layer comprised of plural plies of kraft paper, and an outer layer of label material, said can body having a greater axial length than a standard can body of a given size container,

forming a radially outwardly turned flange having a length of 0.075 inch or greater on one open end of said can body such that the inner layer, structural layer, and outer layer each extend substantially perpendicular to the outer surface of said can body and the thickness of the flange remains substantially the same throughout as that of the thickness of the remainder of the can body except at the area of juncture of said flange and said can body,

positioning a layer of end lining compound on the undersurface of a pair of metal end closures, each of which includes a chuck wall, adjacent shoulder area, seaming panel and cover hook area, said end lining compound extending over said seaming panel, and at least a portion of said hook area and shoulder area, and

placing one of said can end closures with the compound thereon on the flange on one open end of the can body such that said flange engages the compound on said shoul-

der area and said seaming panel and said chuck wall extends axially into the open end of said can body,

double-seaming the can end closure and flange together into a seal between the closure and can body such that the flange of the can body extends axially with the inner liner extending along the seaming panel thereby closing the open end of the can, the lining compound forming a primary hermetic annular side seal between said seaming panel of said closure and the inner liner of the flange of said can body,

and forming a radially outwardly turned flange having a length of 0.075 inch or greater on the opposite open end of the can body such that the inner layer, structural layer, and outer layer each extend substantially perpendicular to the outer surface of said can body and the thickness of the flange remains substantially the same throughout as that of the thickness of the remainder of the can body except at the area of juncture of said flange and said can body,

the other of said pair of can end closures with the compound thereon being adapted for placing it on the flange on said other open end of the can body such that said flange thereon engaging the compound on said shoulder area and said seaming panel and said chuck wall extends axially into the open end of said can body, and adapted for double-seaming the can end closure and said other end flange together into a seal between the closure and can body such that said other flange of the can body extends axially with the inner liner extending along the seaming panel thereby closing the open end of the can, the lining compound forming a primary hermetic annular side seal between said seaming panel of said closure and the inner liner of the flange of said can body.

4. A composite can construction comprising

a cylindrical can body having an inner liner layer, a layer of structural material including plural layers of kraft paper, and an outer label layer,

a metal end closure including a center panel, a chuck wall, and a shoulder area, annular seaming panel area and cover hook area,

an annular flange at one end of said can body formed radially outwardly and having a length of 0.075 inch or greater from the outer peripheral surface of said can body and disposed such that the inner layer, structural layer and outer layer extend substantially perpendicular with said outer peripheral surface of said body and the thickness of the flange remains substantially the same throughout as that of the thickness of the remainder of the can body except at the area of juncture of said flange and said can body, and

a quantity of compound on the underside surface of said metal end closure extending over the entire seaming panel area and onto the shoulder area and cover hook area thereof,

said metal end closure being engageable over the annular flange with said compound disposed therebetween for encircling the open end of said can body, said closure being adapted for a mechanical double-seamed connection with said can body flange such that the flange of the can body extends axially with the inner liner extending along the seaming panel forming a primary hermetic annular side seal of the metal end closure and said can body flange in the area of said compound distribution thereby providing an improved seal on such container end and enhancing the strength of the container at said end connection.

4,538,759

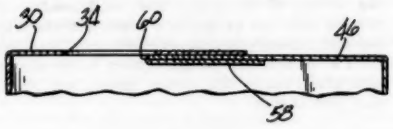
CAN CARTON WITH THREE PLY HANDLE STRUCTURE

Daniel P. Dutcher, Blaine, Minn., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 528,511, Sep. 1, 1983, abandoned. This application Jan. 28, 1985, Ser. No. 695,741

Int. Cl.[3] **B65D** *5/46*

U.S. Cl. 229—52 B **3 Claims**



1. A paperboard carton for carrying a plurality of beverage cans, said carton comprising:

(a) a bottom wall;

(b) a pair of side walls foldably connected to opposite side edges of said bottom wall;

(c) an outer top wall panel foldably connected to a top edge of one of said side walls;

(d) an inner top wall panel foldably connected to a top edge of the other of said side walls, said inner top wall panel having a reinforcement flap connected to an edge of said inner top wall panel along a fold line, said reinforcement flap being folded along said fold line and adhesively secured to an inner surface of said inner top wall panel;

(e) a hand grip opening formed in said outer top wall panel and spaced apart from an inner edge of said outer top wall panel; and

(f) said inner and outer top wall panels being overlapped and adhesively secured together to form a top wall of said carton, said fold line on said inner top wall panel being disposed inwardly adjacent to an inner edge of said hand grip opening and within the perimeter of said hand grip opening, and said fold line extending in two directions beyond the edges of said hand grip opening and being devoid of cuts so as to be continuous and uninterrupted to form a blunt edge on said hand grip opening providing finger comfort when the carton is filled and lifted via said hand grip opening, the portion of said top wall between said inner edge of said hand grip opening and said inner edge of said outer top wall panel consisting of three plies of paperboard material.

4,538,760

AIR CONDITIONER CONTROL ARRANGEMENT FOR AUTOMOTIVE VEHICLE OR THE LIKE

Shinma Kobayashi, Hiratsuka, Japan, assignor to Nissan Shatai Company, Limited, Hiratsuka, Japan

Filed Aug. 25, 1983, Ser. No. 526,428

Claims priority, application Japan, Aug. 27, 1982, 57-147833; Aug. 30, 1982, 57-129726[U]

Int. Cl.[3] **G05D** *23/00*

U.S. Cl. 237—2 A **20 Claims**

1. An air conditioning unit for a vehicle having a cabin, comprising:

a duct for inducting air and for discharging the inducted air into said cabin;

a source of heated fluid;

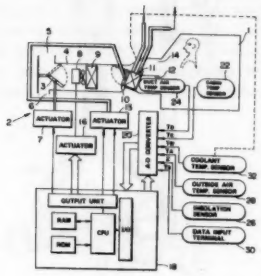
a heat exchanger through which said heated fluid circulates, said heat exchanger being arranged to heat the air in said duct;

a blower associated with said duct and energizable to induce air to flow through said duct;

a sensor for sensing the temperature of said air in said duct,

and for producing a signal indicative of the sensed duct air temperature; and

control means, responsive to said sensor and connected to said blower, for driving said blower at a standby speed when said signal indicates that the temperature of the duct air is below a first predetermined value, for driving said blower at a minimum speed greater than said standby speed when said signal indicates that the temperature of



the duct air is above said first predetermined value and below a second predetermined value greater than said predetermined value, and for increasing the speed of said blower to a controlled speed in a range between said minimum speed and a maximum speed when said signal indicates that the duct air temperature is above said second predetermined value,

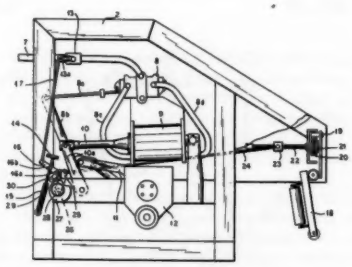
said control means further comprising means for deriving said controlled speed based on blower control parameters.

4,538,761

WINDUP-HOSE IRRIGATING APPARATUS

Adam Ruprechter, Voitsberg, and Herwig Hutter, Köflach, both of Austria, assignors to Rohren- und Pumpenwerk Rudolf Bauer Gesellschaft m.b.H., Voitsberg, Austria

Filed Mar. 4, 1983, Ser. No. 472,099
Claims priority, application Austria, Mar. 4, 1982, 861/82
Int. Cl.[3] B65H *75/00*
U.S. Cl. 239—196 **5 Claims**



1. An irrigating apparatus comprising:

a support;

a hose drum on said support;

a hose adapted to be wound up on said hose drum by the rotation thereof relative to said support;

nozzle means on said hose for dispensing water over an irrigating path as said hose is wound up on said drum;

a water-powered drive on said support operatively connected to said drum for rotating same;

a throttle valve operatively connected to said drive for throttling water flow thereto and controlling the angular velocity of said drum;

a cam rotatable on said support;

connecting means operatively coupling the rotation of said drum with said cam for rotating said cam synchronously with said drum;

a cam follower responsive to a contour of said cam; and

link means operatively connecting said throttle valve with said cam follower for throttling the water supply to said drive in response to rotation of said cam whereby the angular velocity of said drum is reduced as the hose is taken up by said drum, said connecting means including:

a sprocket wheel rotatably synchronized with said drum,

means operatively connecting said sprocket wheel with said cam, said sprocket wheel forming part of a hose guide assembly depositing the hose uniformly in layers on said drum,

a threaded spindle operatively connected to said sprocket wheel,

a nut on said threaded spindle, and

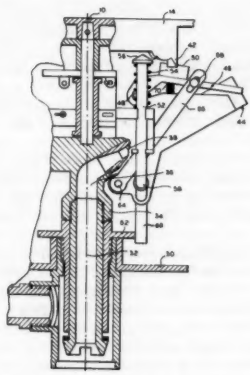
means connecting said nut to said cam.

4,538,762

PATTERN CONTROLLED SPRINKLER APPARATUS

Jack L. Lemkin, Cincinnati, Ohio, assignor to The O. M. Scott & Sons Company, Marysville, Ohio

Filed Apr. 18, 1983, Ser. No. 486,008
Claims priority, application Israel, Apr. 18, 1982, 65515
Int. Cl.[3] B05B *3/08*
U.S. Cl. 239—232 **9 Claims**



1. A rotary sprinkler comprising:

a base;

a stem mounted onto the base for rotation relative thereto, the stem having an inlet for receiving a pressurized water supply;

a water discharge nozzle mounted on the stem and being rotatable together therewith relative to the base;

water driven drive apparatus for rotating the stem relative to the base;

selectably positionable deflector means for engaging a stream of water emitted by said nozzle for controlling the configuration sprinkler stream coverage;

manually settable means for both selecting and displaying an overall pattern configuration of sprinkler stream coverage comprising two concentric abutting surfaces, one of said surfaces being rotatable relative to said stem, the other of said surfaces being fixed relative to said stem, said two abutting surfaces carrying indicia which in combination indicate the pattern configuration; and

said rotatable surface including a cam means, said cam means being modulated in a vertical plane relative to said stem such that in a first mode of operation said cam means engages a first cam following means on said deflector

means to provide a first patterned configuration of sprinkler stream coverage and in a second mode of operation said cam means disengages from said first cam following means and engages a second cam following means on said deflector means to provide a second patterned configuration of sprinkler stream coverage.

4,538,763

NOZZLE CONVENIENTLY ASSEMBLED AND DISASSEMBLED

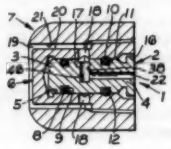
Dennis A. Perry, and David H. Wilmot, both of Nottingham, England, assignors to Hayden Nilos Conflow Limited, Sheffield, England

Filed Mar. 14, 1983, Ser. No. 475,233

Claims priority, application United Kingdom, Mar. 26, 1982, 8208996

Int. Cl.³ B05B *1/00*

U.S. Cl. 239—600 **7 Claims**



1. A liquid spray head comprising a housing, a socket provided in said housing, a body portion releasably located within said housing socket, a supply port for pressurized liquid provided in said housing and disposed about the exterior surface of said body portion, said body portion having an inner end and an outer liquid discharge end, and an interior liquid receiving chamber provided intermediate said ends and connected to said supply port to receive liquid therefrom; a liquid delivery path extending from said chamber to said liquid discharge end of said body portion, said body portion further including liquid supply means opening to the exterior surface of said body portion and connecting said liquid receiving chamber and said liquid supply port provided by said housing, which liquid supply means is disposed to enter said liquid receiving chamber generally radially, in the absence of any axially oriented port means in said body portion leading to said liquid receiving chamber, and liquid sealing means providing a seal between the exterior of said body portion and the housing socket on the side of the liquid supply means corresponding to said inner end of the body portion to prevent liquid pressure from acting on any exterior axially facing surface areas of said body portion which would tend to force the body portion out of said socket, such that axially facing surface areas of the body portion upon which liquid pressure is operable are limited to those such that the resulting force does not tend to urge said body portion from the socket.

4,538,764

METHOD AND APPARATUS FOR PROVIDING FINELY DIVIDED POWDER

Richard M. Dunbar, 7448 Lyndale Ave. S., Ste. 210, Bloomington, Minn. 55420

Filed Jun. 30, 1983, Ser. No. 510,089

Int. Cl.³ B02C *19/06*

U.S. Cl. 241—5 **12 Claims**

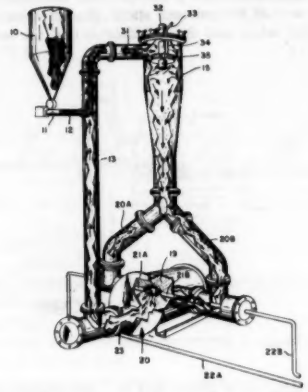
1. The method of providing materials in finely divided form, which comprises

forming a first fluid stream under high velocity having particulate matter entrained therein;

forming a constant gaseous vortex by a second gas steam with said first fluid stream in a first zone so as to separate particulates by driving coarser particles outwardly;

withdrawing fluid and entrained fine particles from said first zone upwardly in a manner so as to maintain rotational movement of the fluid and the entrained particles;

passing coarser entrained particles and fluid downwardly to a second zone having a multiplicity of streams of high



velocity fluids so as to cause impingement of particles moving at high speeds, and

withdrawing fluid having particles entrained therein from said second zone so as to comprise said first fluid stream.

4,538,765

METHOD FOR DEFIBERIZING WASTE PAPER IN A THICK STOCK RANGE

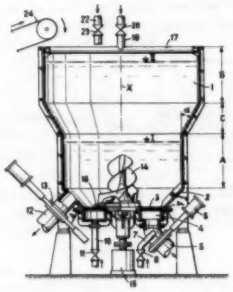
Hermann Mayr, Blaustein; Albrecht Kahmann, Weingarten; Gerhard Lambrecht, Fronreute; Wolfgang Heinbockel, Weingarten; Wolfgang Siewert, Ravensburg-Weingartshof, and Josef Maier, Wolpertswende, all of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg/Württ., Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 447,311

Claims priority, application Switzerland, Dec. 10, 1981, 7887/81

Int. Cl.³ B02C *23/36*

U.S. Cl. 241—21 **8 Claims**



1. In a method of defiberizing waste paper in a thick stock range having a consistency greater than 10%, wherein the waste paper is defiberized in a defiberizing container possessing a rotor under the addition of an appropriate quantity of water and, if desired, chemicals, the improvement which comprises the steps:

defiberizing the waste paper at a consistency greater than 10% in a single defiberizing container;

subsequently diluting the defiberized stock located said single defiberizing container to a consistency of less than 7% through the addition of water and thus placing the stock into a fluent and pumpable state in order to obtain a thin stock;

continuing said step of defiberizing the waste paper in said single defiberizing container during said step of diluting the defiberized stock;

thereafter withdrawing the thus obtained thin stock through a screen located at a lower region of said single defiberizing container for further use of said thin stock; and

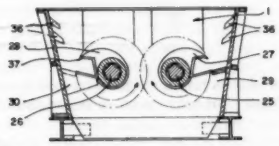
withdrawing residues which have not penetrated through the screen through a screenless opening located at the lower region of said single defiberizing container.

4,538,766

PROCESS AND APPARATUS FOR CRUSHING RAW MATERIALS

Joseph Vandenbussche, Roeselare, Belgium, assignor to Constructie Werkhuizen Vandekerckhove N.V., Roeselare, Belgium

Filed Jun. 3, 1983, Ser. No. 500,848
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—30 **20 Claims**



1. An energy saving comminuter for waste materials, particularly offal, animal carcasses and the like, comprising:

(a) a pair of end walls and a pair of spaced apart sidewalls extending therebetween defining a longitudinally extending comminuting zone;

(b) actuation means operably associated with at least one of said walls;

(c) at least three actuable series of comminuting units operably associated with said actuation means and actuable thereby into and out of said comminuting zone; and,

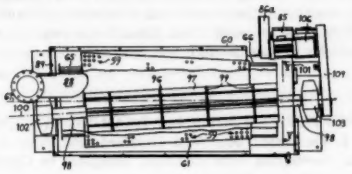
(d) the comminuting units of each of said series disposed in a successively staggered inclined relation adjacent said comminuting zone and each of said series successively disposed behind a first of said at least three series so that the last unit of the first of said series is positioned for impaction in said comminuting zone before the first unit of the next succeeding series and the units of any series are interdigitated between the units of any other series so that successive actuation of each of said at least three series by said actuation means causes the units of each of said series to impact certain areas of waste material disposed in said comminuting zone and to successively impact the waste material and to thereby avoid simultaneous impaction of immediately adjacent areas of the waste material.

4,538,767

APPARATUS FOR RECOVERING PAPER-MAKING FIBER FROM CONTAMINATED WASTE PAPER PRODUCTS

John J. Pimley, Pontypool, Wales, assignor to The Black Clawson Company, Middletown, Ohio

Continuation of Ser. No. 409,223, Aug. 18, 1982, abandoned.
This application Nov. 27, 1984, Ser. No. 675,254
Claims priority, application United Kingdom, Aug. 20, 1981, 8125510
Int. Cl.³ B02C *13/13*
U.S. Cl. 241—79.3 **6 Claims**



1. Apparatus for treating a liquid suspension of paper-making material mixed with a large proportion of plastic sheet material to defiber and separate the paper-making material from the plastic, comprising:

a. casing means including a bottom part forming a collecting trough,

b. a drum disposed in said casing means, said drum extending along and being rotatable about a generally horizontal central axis and being open at its axial ends, said drum being frusto-conical in shape so that the opening at one axial end of the drum is larger than the opening at the other axial end of said drum, the larger end constituting an inlet end for delivering said liquid suspension to said drum,

c. said drum including a wall of circular cross-section, said wall extending along a generally horizontal central axis, said wall being open at its axial ends and there being multiple perforations in said wall along substantially the entire length of said wall,

d. said drum having a plurality of generally axially arranged vane members projecting radially inwardly from said wall along substantially the entire length of said wall,

e. means supporting said drum for rotation about the central axis of said drum,

f. inlet means for receiving a liquid slurry of paper-making material and plastic contaminants from a pulper and delivering such slurry to one end of said drum,

g. means forming a discharge outlet from an end of said drum opposite and distal said one end of said drum arranged to provide for continuous discharge from said drum of solid materials too large to pass through said perforations,

h. means for rotating said drum about the central axis of said drum to cause said vane members to lift solid materials from said slurry to an upper region in said drum from which upper region said materials fall downwardly,

i. a rotor mounted to extend within said drum for rotation about a horizontal axis offset from said central axis of said drum and inclined with respect to a vertical plane that contains said central axis of said drum, said axis of said rotor being inclined to said vertical plane at an angle of inclination that is substantially equal to the angle of frusto-conical taper of said drum so that said axis of said rotor is substantially parallel to a line containing a line segment formed by the intersection of a horizontal plane with an inner surface of said drum,

j. said rotor being of a length equal to a substantial portion of the length of said drum and having radially projecting blades extending axially along said rotor for substantially all of said length of said rotor, said rotor being disposed

above the central axis of said drum and adjacent to the upwardly moving side of said drum,

k. drive means for rotating said rotor to cause said blades to impel said solid materials dropping thereon from said vane members back against said drum wall to assist defibering of the paper making constituents to small particles capable of passing through said perforations into surrounding space within said casing means for collection in and removal from said trough,

l. said rotor having its maximum diameter such as to provide significant space between said rotor blades and said vane members assuring minimum tendency for comminution of the plastic constituents of said solid materials, and

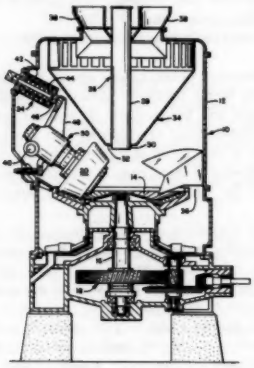
m. shower means within said drum for assisting said small particles to pass through said perforations.

4,538,768

PULVERIZER JOURNAL BEARING SYSTEM

Frank J. Paskowski, Jr., West Hartford, and Peter L. Stanwicks, Newington, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 27, 1983, Ser. No. 489,279
Int. Cl.³ B02C *15/04*
U.S. Cl. 241—101.2 **6 Claims**



1. A pulverized bearing system operative for providing bearing support for a pulverizer roll in a bowl mill comprising:

a. a journal shaft embodying a multiplicity of portions of differing dimensions, said journal shaft including a first portion having a first diameter, a second portion having a second diameter, a third portion having a third diameter and a fourth portion having a fourth diameter;

b. a lower bearing supported in surrounding relation to said first portion of said journal shaft, said lower bearing being operative to provide a first bearing support for said journal shaft;

c. a lower journal housing supported in surrounding relation to said second portion of said journal shaft, said lower journal housing being operative to retain said lower bearing in supported relation on said journal shaft, said lower journal housing further being operative to receive the pulverizer roll in mounted relation thereon;

d. an upper bearing supported in surrounding relation to said third portion of said journal shaft, said upper bearing being operative to provide a second bearing support for said jounal shaft, said upper bearing being spaced a predetermined distance along the length of said journal shaft from said lower bearing so that the resultant force acting on said journal shaft acts within the bearing span defined by said upper bearing and said lower bearing;

e. oil seal wear ring means supported in surrounding relation to said journal shaft, said oil seal wear ring means being operative to provide said journal shaft with an oil seal;

f. an upper journal housing supported in surrounding relation to said third portion of said journal shaft, said upper jounal housing being operative to retain both said upper bearing and said oil seal wear ring means in supported relation on said journal shaft;

g. a journal head supported in surrounding relation to said fourth portion of said journal shaft; and

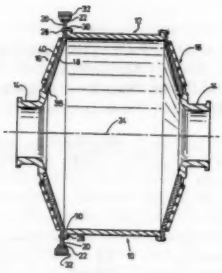
h. an air seal ring means supported on said journal head so as to be positioned in engagement with the exterior surface of said upper journal housing, said air seal ring means being operative to effectuate control over seal air pressure.

4,538,769

GRINDING MILL CONSTRUCTION

Jack Wisnia, Montreal, and Norman A. Stock, Beaconsfield, both of Canada, assignors to Dominion Engineering Works Limited, Lachine, Canada

Continuation-in-part of Ser. No. 288,459, Jul. 30, 1981, abandoned. This application Jun. 7, 1983, Ser. No. 502,006
Claims priority, application Canada, Nov. 28, 1980, 365775
Int. Cl.³ B02C *17/18*
U.S. Cl. 241—179 **9 Claims**



1. A mill head structure for a grinding mill having a hollow drum and mounted for rotation on an axis of rotation, said mill head structure comprising:

(a) a conical head portion with a central axis aligned with said axis of rotation, a rib portion integral with and projecting radially outward from said head portion and a gear flange portion integral with and projecting radially outward from said rib portion, said head, rib and flange portions being cast as an integral unit, said head structure being adapted to be secured to said drum adjacent the junction of said head portion with said rib portion with a significant portion of said rib portion extending radially outward relative to said drum, and said gear flange portion having a periphery centered about the central axis of said conical head portion; and

(b) a plurality of gear rim means, positioned in juxtaposed relation around the periphery of said gear flange portion, being removably secured with said gear flange portion to provide a continuously toothed gear annulus for accurate meshing relation with a pinion.

4,538,770

APPARATUS FOR WINDING WIRE COILS ON A TOOTHED STACK

Richard D. Sedgewick, 100 Horne St., Dover, N.H. 03820

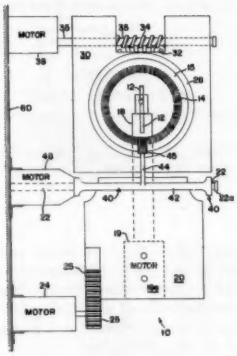
Filed Sep. 27, 1982, Ser. No. 424,502
Int. Cl.³ H02K *15/085*
U.S. Cl. 242—1.1 R **14 Claims**

12. Apparatus for winding wire around selected teeth of a toothed or slotted stack having a row of teeth, including wire feed winding guide means for guiding wire around selected

teeth of a toothed or slotted stack, and stack mounting means constructed and arranged for operatively mounting a toothed or slotted stack relative to the wire feed winding guide means, the improvement comprising:

wire holding clamp means operatively positioned on either side of a row of teeth of a toothed or slotted stack mounted on the stack mounting means, each said clamp means formed with a substantially flat pliant bearing surface in the direction facing said teeth;

clamp mounting means operatively mounting each said clamp means for movement toward and away from said row of teeth between a stationary clamp position pushing



against the side of the row of teeth for holding winding wire in place and an open position, in which stationary clamp position the pliant bearing surface of the clamp means bears against a portion of one side of the row of teeth conforming to the surface of any winding already formed around selected teeth so that the winding wire is held in place against the side of the row of teeth while the wire feed winding guide means is guiding wire; and

clamp motor means operatively coupled to the clamp mounting means for moving said clamp means alternatively between the stationary clamp position and the open position to facilitate selective winding of wire around selected teeth.

4,538,771

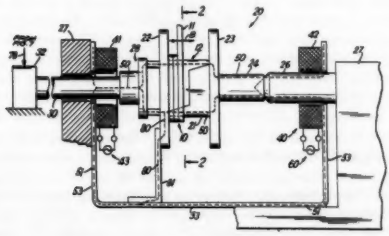
APPARATUS FOR TESTING THE INTEGRITY OF AN ELECTRICAL COIL AS IT IS WOUND

John Tardy, Somerville, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 267,980, May 28, 1981, Pat. No. 4,416,057. This application Oct. 11, 1983, Ser. No. 540,942

Int. Cl.³ H01F *41/06*

U.S. Cl. 242—7.12 **19 Claims**



1. Apparatus for testing the integrity of an electrical coil including turns of an insulated wire being wound on a core member in a winding machine, which comprises:

a first test winding positioned adjacent to one side of the coil being wound;

a second test winding positioned adjacent to another side of the coil being wound;

means for applying an A.C. input signal to the first test winding;

means for magnetically coupling the test windings to each other and to the coil being wound, said coupling means including means responsive to the input signal for inducing in the second winding an A.C. output signal having a first voltage characteristic when the turns of the coil being wound are not shorted and having a different voltage characteristic when a short occurs; and

means for detecting such a difference in the output signal characteristic to provide an indication that the turns being wound are shorted.

4,538,772

WINDING APPARATUS

Richard E. Davies, 1 Homelands Ave., Angmering-on-Sea, West Sussex, England

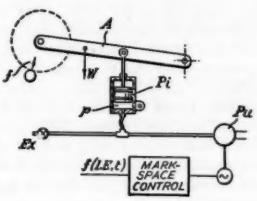
PCT No. PCT/GB82/00313, § 371 Date Jul. 1, 1983, § 102(e) Date Jul. 1, 1983, PCT Pub. No. WO83/01610, PCT Pub. Date May 11, 1983

PCT Filed Nov. 2, 1982, Ser. No. 519,768

Claims priority, application United Kingdom, Nov. 4, 1981, 8133237

Int. Cl.³ B65H *54/02*

U.S. Cl. 242—18 R **11 Claims**



1. An apparatus for winding flexible material to form a package, comprising:

an arm pivotally mounted at one end for movement about a horizontal axis;

a motor-driven mandrel rotatably mounted at an opposite end of said arm;

bar means, adjacent said mandrel, for engaging and supporting a package of material wound on said mandrel;

gravitationally-responsive means, associated with said arm, for urging the package against said bar means such that pressure is applied to the periphery of the package by said bar means;

force transducer means, coupled to said arm, for applying a force to said arm in opposition to said gravitationally-responsive means;

a first sensor means for emitting a first signal representation of actual package rolling resistance;

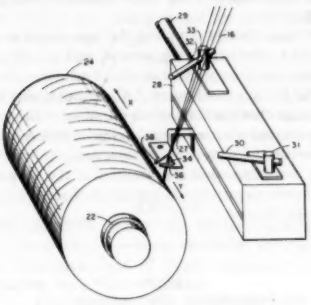
an input means for emitting a second signal representative of a reference valve for packaging rolling resistance;

control means, coupled to said force transducer means, said first sensor means and said input means, for automatically controlling said force applied by said force transducer means to automatically control packing density of the package in response to differences between said first and second signals by varying said force until said first and second signals are substantially equal.

4,538,773
APPARATUS FOR COLLECTING STRANDS

Eugene D. McEathron, Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 21, 1984, Ser. No. 581,626
Int. Cl.[3] B65H *54/00, 54/28, 57/28*
U.S. Cl. 242—18 G 10 Claims



1. An apparatus for producing and collecting a plurality of strands:

(a) a means for forming a plurality of continuous filaments from a supply,

(b) means for gathering the plurality of filaments into more than one strand,

(c) rotatable winder to attenuate and collect the continuous filaments in a successively layered package,

(d) a traverse guide horizontally positioned to engage the strands along one or the other of two angularly opposing sides attached to a base to guide the strands into essentially uncross, side-by-side relation onto the rotating winder, the traverse guide having two angularly opposing sides inclined toward each other one of said sides being longer in a horizontal plane than the other, both sides defining an opening at their free ends and defining a containment zone with said base, said opening being of a size sufficient to permit strands to enter the containment area,

(e) means for reciprocating the traverse guide to traverse the strands parallel to the axis of rotation of the winder to distribute the strands in successive layers on the rotating winder, and

(f) contacting means positioned nearly in line with each end of the package, means to move the traverse guide partially past said contacting means so that strands contact said contacting means and are gathered into a group of strands on the base at the convergence of one side thereof so that the traverse guide directs the strands onto the winder around the end portion of the layers of the package.

4,538,774
WEBBING TENSION DEVICE

Teruhiko Kawaguchi; Yuji Nishimura, and Akinori Fujiwara, all of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Mar. 28, 1984, Ser. No. 594,196
Claims priority, application Japan, Mar. 30, 1983, 58-46164[U]
Int. Cl.[3] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107 16 Claims

1. A webbing tension device adapted for use in a webbing retractor for protecting an occupant in an emergency situation of a vehicle, which comprises:

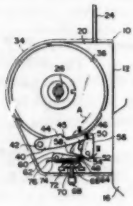
(a) a wheel supported by a webbing takeup shaft of the webbing retractor;

(b) first resilient means biasing the wheel in a direction of a retraction of an occupant restraining webbing;

(c) a pawl caused to latch to a portion of the wheel, thereby preventing the wheel from its rotation;

(d) cam means abutting on the pawl to support it, thereby maintaining a latching situation of the pawl and the wheel, the cam means allowing the pawl to be released from the wheel when the cam means is rotated in one direction;

(e) trigger means causing the cam means to rotate in the one direction to release the pawl from the wheel in the emergency situation of the vehicle, the trigger means having a reversible structure including an acceleration sensor detecting the emergency situation of the vehicle, a trigger



member opposed to the cam means and rotated by the acceleration sensor in the emergency situation of the vehicle and second resilient means biasing the trigger member, the direction of the biasing force of the second resilient means being reversed at a pedetermined rotated position of the trigger member; and

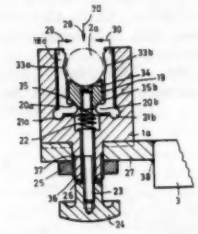
(f) clutch means connecting the wheel to the takeup shaft to transmit a biasing force of the first resilient means to the takeup shaft when the wheel is rotated,

whereby the pawl and the wheel are securely latched to and released from each other.

4,538,775
APPARATUS FOR THE SPINDLELESS MOUNTING, AS WELL AS THE CUTTING AND CUTTING TO LENGTH AND SIMULTANEOUS MEASUREMENT OF SPOOLS

Hans Deissenberger, Bildechingen, 7240 Horb, Fed. Rep. of Germany

Filed Sep. 3, 1982, Ser. No. 414,538
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 3134824
Int. Cl.[3] F16D *51/16;* B60T *13/04;* B65H *75/30*
U.S. Cl. 242—129.51 11 Claims



1. An apparatus for spindleless mounting, as well as for cutting and cutting to length and simultaneous measurement of lengths of strands wound on spools arranged in juxtaposed and/or superimposed manner in a supporting frame, wherein the spools can easily be replaced by others of different sizes having outer disks provided with short spindles and wherein the spool bearings of the supporting frame are open at the top for receiving said spindles, said bearings being mounted for movement only in a vertical plane,

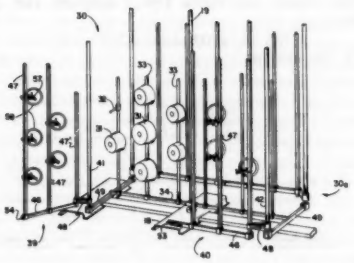
(a) the spool bearings being arranged on horizontal arms, which are in turn mounted on a common crossbar of the supporting frame,
(b) the horizontal arms being displaceably mounted on the crossbar,
(c) said crossbar having a many-sided cross-section surrounded by correspondingly many-sided rings, which are fixed to the arms,
(d) the spool bearings having levers provided with brake shoes and below the bearings, each lever has a pivot bearing which is externally positioned with respect to the spindle bearing and in which is movably mounted a lever, as well as in each case an internally located bearing point on which rests the proportional weight of the spool or reel.

4,538,776

CREEL APPARATUS

T. Cooper Perry, Roanoke, Ala., assignor to West Point Foundry & Machine Co., West Point, Ga.

Filed Mar. 14, 1984, Ser. No. 589,500
Int. Cl.³ B65H *49/02*; D02H *1/00*; D03J *5/08*
U.S. Cl. 242—131 **6 Claims**



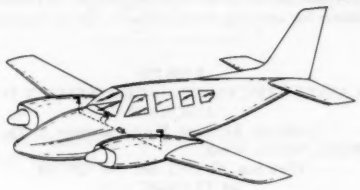
1. Creel apparatus for supporting a plurality of yarn packages feeding yarns to a yarn receiving apparatus such as a warper or the like, comprising in combination:
support means for mounting in predetermined relation to a yarn receiving apparatus;
frame means having first and second yarn package supporting sides, and having means mounting said support means for rotation between first and second positions respectively placing either of said sides in active yarn feeding relation to the yarn receiving apparatus while the other side is in an inactive relation thereto;
a first plurality of yarn tensioning means associated with the first side of said frame means and operative to engage the yarns from the yarn packages received on said first side;
a second plurality of yarn tensioning means associated with the second side of said frame means and operative to engage the yarns from the yarn packages received on said second side; and
said first and second pluralities of yarn tensioning means mounted for movement with said frame means as the frame means rotates between said first and second positions, so that the yarns from the yarn packages on the said side positioned in inactive relation to the yarn receiving apparatus can be threaded to engage said tensioning means associated with that inactive side while yarns from the yarn packages on the other said side positioned in active relation to the yarn receiving apparatus are being drawn from said active side by that apparatus,
whereby said frame means including said tension means can be rotated to reposition the previously-threaded inactive side into the active yarn feeding relation to the yarn receiving apparatus as the previously-active side is repositioned to inactive relation ready for loading and threading a fresh supply of yarn packages.

4,538,777

LOW THRUST DETECTION SYSTEM FOR AIRCRAFT ENGINES

Sherman E. Hall, 175 Union Ave. NE., Renton, Wash. 98055

Continuation of Ser. No. 239,423, Mar. 2, 1981, abandoned. This application May 24, 1983, Ser. No. 497,660
Int. Cl.³ B64D *47/02*
U.S. Cl. 244—1 R **6 Claims**



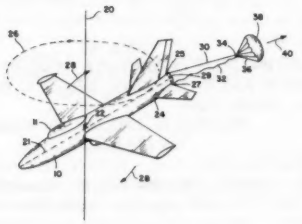
1. Thrust loss detection system for aircraft with at least two engines having propellers driven thereby, comprising:
(a) a single, engine thrust loss sensor means for each engine mounted so as to be located in the slip stream of its respective engine propeller and being responsive to air pressure from the engine propeller,
(b) a plurality of electrical switch means located within the body of said aircraft and connected by pneumatic conduit means to each of said sensor means for transmitting air pressure from each of said sensors to said plurality of switch means, said switch means being responsive to predetermined differences in thrust between the engines such that upon the occurrence of a predetermined amount of partial loss to full loss of engine thrust, said electrical switch means will be energized to produce an electrical signal indicative of either a partial or total loss of power in a given engine,
(c) visual signal indicator means for each engine attached to the cockpit propeller controls and connected to said switch means, said visual signal indicator means signalling to the aircraft operator which engine is losing power so that corrective action can be taken.

4,538,778

DUAL TOWLINE SPIN-RECOVERY DEVICE

William L. White, Wicomico, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 15, 1983, Ser. No. 532,342
Int. Cl.³ B64C *17/00*
U.S. Cl. 244—75 R **11 Claims**



1. A device for recovering an aircraft from an uncontrollable aerodynamic spin during aircraft operation comprising:
an aircraft having a rear surface;
means in addition to the conventional aircraft controls for applying force to said rear surface;

means for orienting said means for applying force to said rear surface to exert an anti-spin yaw and an anti-spin rolling moment acting together on said aircraft and to automatically cease to exert both said anti-spin yaw and said anti-spin rolling moment upon correction of the spin;

said means for orienting and applying a force being of a size and shape so as to allow said aircraft to fly after spin recovery without removing said means; and

attachment means for securing said means for orienting said means for applying force to the rear of said aircraft.

4,538,779

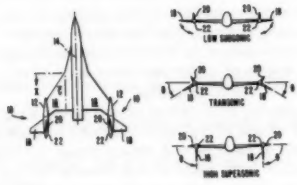
CASTER TYPE EMPENNAGE ASSEMBLY FOR AIRCRAFT

Sidney E. Goldstein, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1982, Ser. No. 429,259

Int. Cl.³ B64C *5/10*

U.S. Cl. 244—87 **20 Claims**



1. An empennage assembly for aircraft, comprising:

a fuselage;

wing means secured to said fuselage for defining therewith an aerodynamic center;

empennage means, including a vertical stablizer having an aerodynamic center, and a horizontal stabilizer having an aerodynamic center; and

boom means, upon which said empennage means are mounted, secured to at least one of said fuselage or wing means and extending longitudinally rearwardly of said aircraft for defining moment arms between said aerodynamic centers of said vertical and horizontal stabilizers and said aerodynamic center of said fuselage-wing means,

said empennage means being rotatably secured to said boom means about the longitudinal axis of said boom means so as to alter the positions of said vertical and horizontal stabilizers relative to a horizontal plane which normally includes said horizontal stabilizer for imparting to said aircraft substantially constant directional static stability throughout the subsonic, transonic, and high supersonic speed ranges as a result of said vertical and horizontal stabilizers acting through said moment arms.

4,538,780

ULTRALIGHT COMPOSITE WING STRUCTURE

Richard D. Roe, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 26, 1983, Ser. No. 535,421

Int. Cl.³ B64C *3/18*

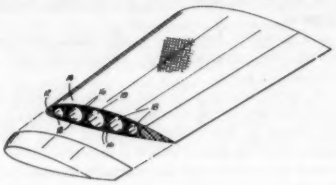
U.S. Cl. 244—123 **6 Claims**

1. A composite wing structure, the structure comprising:

a wing body made of a lightweight foam material and the like;

a reinforced plastic wing skin, the skin disposed around the body of the wing; and

a plurality of longitudinal tendons running along the length of the body of the wing and adjacent the wing skin, the tendons including a plurality of individual tendon members joined together end to end by plastic shear lugs adhesively bonded to each other, the lugs extending laterally outward into the foam body for transferring tension loading along the length of the tendons to shear loading in the foam body of the wing structure.



4,538,781

CONTROL SYSTEM FOR CONTROLLING THE PASSAGE OF VEHICLES

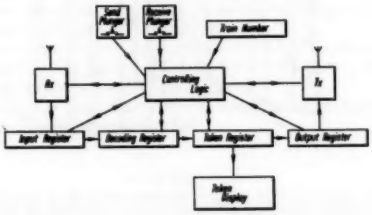
Michael S. Birkin, Beeston, England, assignor to British Railways Board, London, England

Filed Oct. 4, 1982, Ser. No. 432,435

Claims priority, application United Kingdom, Oct. 3, 1981, 8129916

Int. Cl.³ B61L *3/00, 27/00, 1/08*

U.S. Cl. 246—187 B **4 Claims**



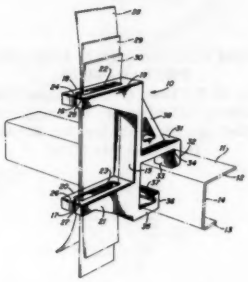
1. A control system for controlling the passage of vehicles, of the kind in which the vehicles are authorized to pass through a restricted section by means of a unique token which is passed from a control point to a vehicle prior to entering said section and returned to a control point upon leaving said section, characterized in that said system is electronic and includes a control center having means for storing the identity of one, or a number of electronic tokens, each being unique to a particular restricted section, means for storing vehicle identities to which tokens are to be or have been issued, means for receiving the identity of each vehicle and checking its validity, means for encoding the electronic token to be transmitted to ensure the uniqueness of its reception by the relevant vehicle, means for controlling the system in a logical and proper sequence, interface means forming part of said control center, a display connected to said control center and the said interface means for displaying the status of the system to the controller, and an input keyboard also connected to said control center via said interface means for token sending and receiving by the controller, said system also including a number of vehicles each having a unique electronically encoded identity, means for sending said unique identity, means for receiving an electronic token and checking its validity, means for displaying the identity of a received token to the vehicle operator, and means for withdrawing the said token, and said system including transmission means for transmitting the said token and vehicle identity information between said control center and said vehicles, the arrangement being such that an electronic token can only be issued or withdrawn when the controller and vehicle operator simultaneously operate their relevant token issuing and withdrawing means.

4,538,782

ELECTRICAL CABLE SUPPORTING CLAMP

Bernard Kirschenbaum, Denver, Colo., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed May 19, 1983, Ser. No. 496,305
Int. Cl.³ F16B *2/20*
U.S. Cl. 248—68.1 **1 Claim**



1. A clamp for supporting a plurality of flat electrical cables in a predetermined orientation, adapted for mounting on a cross-member of an electrical interconnection frame extending in a direction perpendicular to said predetermined orientation; said clamp comprising a backplate extending in a direction parallel to said predetermined orientation, a pair of cable jaws extending from opposite ends of one side of said backplate in a direction perpendicular to said backplate, each of said jaws comprising a pair of aligned spaced-apart arms defining an elongated substantially rectangular slot having the longer dimension perpendicular to said backplate, for loosely holding said plurality of flat electrical cables, each of said arms having a nub on one end inwardly directed into said slot for admitting and trapping said cables, and bracket means extending from the other side of said backplate for slidably mounting said clamp on said cross-member, said bracket means comprising first and second parallel arms extending from said backplate in a direction opposite to said cable jaws, each arm of said bracket having a lip at its end extending toward the other arm of said bracket and a catch extending from said lip toward said backplate for clasping said cross-member.

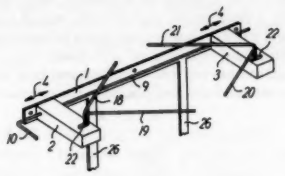
4,538,783

SUSPENSION RACK FOR BAGS AND SACKS, IN PARTICULAR REFUSE DISPOSAL BAGS FOR DOMESTIC PURPOSES

Jens M. D. Stobbe, Residence du Prieuré Route des Hautes Valettes, Tourettes sur Loup Vence 06140, France

PCT No. PCT/DK82/00078, § 371 Date Apr. 21, 1983, § 102(e) Date Apr. 21, 1983, PCT Pub. No. WO83/00679, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 23, 1982, Ser. No. 495,344
Claims priority, application Denmark, Aug. 24, 1981, 3747/81
Int. Cl.³ B65D *25/14*
U.S. Cl. 248—99 **6 Claims**

1. A suspension rack for bags and sacks, comprising:
a base member secured to a support structure,
a pair of brackets projecting from said base member, and
a discontinuous frame-like collapsible bag carrier mounted on said brackets and adapted to engage and circumferentially stretch an everted portion of a bag at the open end thereof,
said bag carrier including a pair of holders, each said holder mounted in a respective bracket, and formed by a pair of frame limbs which are movable between a closed parallel position and an open V-like position, the vertices of the holders pointing away from each other,
at least one of said holders being displaceable in its bracket substantially parallel to said base member and being resiliently biased in a direction away from the other holder to



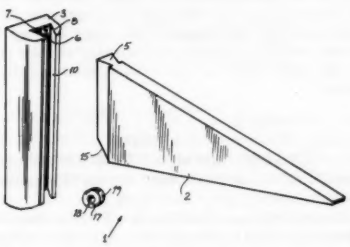
permanently keep said everted bag portion circumferentially stretched.

4,538,784

SUPPORT ASSEMBLY FOR SHELVING

Michael O'Flanagan, Loughlinstown, Ireland, assignor to Institute for Industrial Research & Standards, Dublin, Ireland

Filed Aug. 12, 1982, Ser. No. 407,491
Claims priority, application Ireland, Aug. 20, 1981, 1913/81
Int. Cl.³ A47G *29/02*
U.S. Cl. 248—244 **13 Claims**



1. A support assembly for shelving comprising:
an upright having an outwardly-facing channelled groove, the groove having spaced-apart front and rear retaining faces, a bracket for supporting a shelf, a tongue projecting rearwardly of the bracket, the tongue being dimensioned for confinment between the front and rear retaining faces of the groove, a reception means formed between the tongue and the upright by cutting away portion of the bottom corner of the tongue to provide an upwardly extending slot between the tongue and the rear retaining face of the groove, a wedging member mounted within the slot, between a rear face of the groove and a front face of the cut-away bottom of the tongue, to urge the lower portion of the tongue forwardly against the front face of the groove to distribute the horizontal component of a load force applied to the bracket over the interface area between the tongue and groove and to resist the vertical component of the load force.

4,538,785

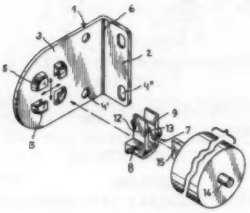
MOUNTING FOR THE SETTING UP OF BLINDS

Raymond Damsgaard, Ryslinge, Denmark, assignor to A/S Chr. Fabers Fabriker, Ryslinge, Denmark

Filed Nov. 2, 1983, Ser. No. 548,010
Claims priority, application Denmark, Nov. 22, 1982, 5186/82
Int. Cl.³ A47H *1/10*
U.S. Cl. 248—268 **3 Claims**

1. Mountings for the setting up of blinds with a blind roller which has at one end a round-end-view cylindrical axle journal and at the other end an angular axle journal, and where two such mountings are intended to be mated to the ends of the

blind roller and to form at one end an angular bearing for the taking up and securing against rotation of an axle journal with angular cross-section, and at the other end a round bearing for the taking up of a round axle journal, said mountings each comprising a plate angle, and suitably mated inlay, said plate angle which itself comprises two sides having holes for use by fixed screws, and one side of said plate angle comprises an internal surface having four punched-and-bent pockets, which have been shaped from and placed in the corners of a square of



said surface in such a way that each said pocket is open towards the two neighbouring pockets, said inlay comprising two carrying-surfaces, and two legs, said carrying surfaces suitably shaped such that they can be pushed into and carried by two neighbouring pockets on said plate angle, said two legs each having inner surfaces and outer surfaces, delimiting between said legs an essentially U-shaped bearing for an axle journal, one inlay for said axle journal of angular cross-section and the other inlay for said round-end-view cylindrical axle journal.

4,538,786

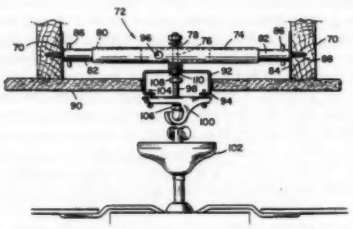
CEILING FAN MOUNTING APPARATUS

Joseph H. Manning, North Fort Meyers, Fla., assignor to Man-Mor Industries, Inc., Cape Coral, Fla.

Continuation-in-part of Ser. No. 277,939, Jun. 26, 1981, abandoned. This application Nov. 2, 1983, Ser. No. 548,147

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—544 **5 Claims**



1. Apparatus for mounting a fan or similar device adjacent a ceiling having joists supporting the ceiling, comprising:

a vertical mounting rod adapted to be aligned with a hole in the ceiling and having the fan or similar device mountable to a lower end thereof; and,

support means adapted to be carried by the adjacent joists for supporting the vertical mounting rod, the support means comprising

a hollow sleeve having oppositely disposed slots at each end,

an end member at each end of the sleeve and having an inner portion received within the sleeve and movable longitudinally therein and an end plate on the outer end thereof, a screw extending longitudinally from the outer face of the end plate to fasten to an opposing joist, each end member having a pair of diametrically arranged pins proximate to the end plate which are receivable in the slots in the sleeve on substantially full insertion of the inner portion of said end member to cause the sleeve and end member to be rotatable together, and,

means carried by the sleeve for facilitating rotation of the sleeve.

4,538,787

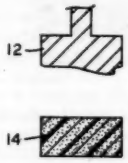
RIGID-FOAM PLASTIC MOLD AND METHOD OF PREPARATION

Richard B. Fox, 40 Tri Town Cir., Mashpee, Mass. 02649, and James B. Sullivan, 343 Main St., Dennisport, Mass. 02639

Filed Apr. 25, 1983, Ser. No. 488,347

Int. Cl.³ B29D *27/00*

U.S. Cl. 249—112 **29 Claims**



1. A method for the preparation of a rigid composite thermoplastic foam mold element of a multi-part mold comprising male and female mold elements, each mold element having a thermoplastic rigid foam body, a back surface, and a solid interior mold facing surface contoured so as to form in a closed mold position a mold cavity to prepare a defined object by a molding process, which method comprises:

(a) contacting under substantially continuous pressure with a heated die element one surface of a first rigid thermoplastic foam material to melt and deform the contacted foam portion of the rigid thermoplastic foam material; and

(b) rapidly chilling the die element while maintaining the die element in substantially continuous contact with the thermoplastic foam material to form a thin, solid skin layer of the cooled thermoplastic foam material as a mold facing surface, which solid skin layer is integrally bonded to the underlying body of the rigid thermoplastic foam material,

thereby providing either a male or female mold element of a multi-part mold.

4,538,788

VALVE MECHANISM FOR CAN FILLING MACHINES

Everett S. Minard, Sacramento, Calif., assignor to Elmar Industries, Inc., Santa Clara, Calif.

Division of Ser. No. 467,182, Feb. 16, 1983,. This application Apr. 5, 1984, Ser. No. 596,857

Int. Cl.³ F16K *35/00*

U.S. Cl. 251—107 **1 Claim**

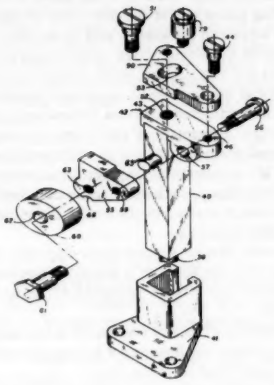
1. A valve mechanism for filling machines comprising:

a valve stem movable along a substantially vertical axis and having an upper portion presenting a substantially horizontal upper surface,

a cam follower including a roller and a roller mounting plate presenting a substantially horizontal upper surface pivotally mounted for movement in a substantially vertical plane on said valve stem; said horizontal surfaces lying in substantially the same plane in their lowermost positions, and

means for locking said cam follower plate against such pivotal movement including

a member pivotally mounted on said valve stem for selective movement in a substantially horizontal plane into



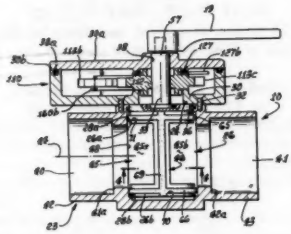
or away from a position overlying said upper surface of said roller mounting plate.

4,538,789

AUTOMATIC AND MANUAL ACTUATOR

Sangchol An, Rolling Heights, Calif., assignor to Purex Pool Products, Inc., Lakewood, Calif.

Filed May 2, 1983, Ser. No. 490,376
Int. Cl.³ F16K *31/02*
U.S. Cl. 251—129.12 **10 Claims**



1. For use in controlling, both automatically and manually, a valve stopper movable between first and second positions to control fluid flow through the valve the improvement comprising

(a) a power source,

(b) a drive coupling the power source to the stopper to move the stopper between said positions,

(c) an input for transmitting movement between a manual actuator and the stopper to move the stopper between said positions, and

(d) the driver including decoupling means operable in response to said transmission of movement as defined in (c) above to interrupt the coupling of said source to the stopper,

(e) said drive including a first gear driven by the power source, a third gear driving said stopper, and said decoupling means comprises a second gear meshing with the first and third gears and movable out of drive transmitting relation with at least one of the first and third gears in response to manual actuation of the drive,

(f) and including guide means on a housing for said gears to guide said second gear toward and away from said third gear, the second gear having axially spaced hub structures engaging said guide means to be guided thereby, whereby the second gear directly meshes with the first and third gears,

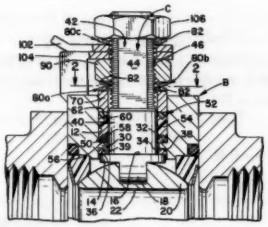
(g) said first and second gears remaining in mesh during movement of the second gear toward and away from said third gear, all of said gears remaining in substantially the same plane.

4,538,790

VALVE STEM PACKING ASSEMBLY

Peter C. Williams, Cleveland Heights; Ulrich H. Koch, Bainbridge Township, Cuyahoga County; Edward M. Yusko, Jr., Cleveland, and Thomas M. Mannion, University Heights, all of Ohio, assignors to Whitey Co., Highland Heights, Ohio

Filed Mar. 24, 1983, Ser. No. 478,270
Int. Cl.³ F21K *3/44*
U.S. Cl. 251—214 **28 Claims**



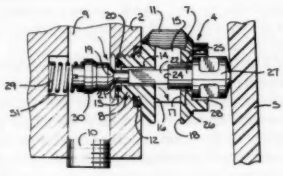
14. A valve body having a stem passage defined by a side wall rotatably receiving a valve stem; an inwardly extending flange in said passage; an outwardly extending shoulder on said valve stem for cooperation with said flange to prevent outward displacement of said valve stem from said passage; and, a thrust washer interposed between said flange and shoulder substantially filling the radial space between said stem and the side wall of said passage, said thrust washer having one end surface in facing relation to said flange, an other end surface in opposed spaced relation to said one end surface and an outer peripheral surface with a chamfer extending between said one end surface and said outer peripheral surface, and said thrust washer further having a coating of low friction material on the surfaces thereof and at least one of said one and other end surfaces including lubricant housing means.

4,538,791

VALVE MECHANISM FOR A LIVESTOCK WATERING BOWL

Terry K. Wostal, Baraboo, Wis., assignor to Norse Leasing Corp., Phoenix, Ariz.

Filed Apr. 10, 1984, Ser. No. 598,536
Int. Cl.³ A01K *39/02*
U.S. Cl. 251—339 **9 Claims**



1. A valve construction for a livestock watering apparatus, comprising a bowl having an inlet conduit to be connected to

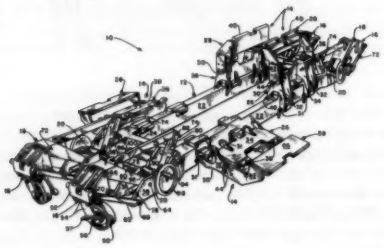
a source of water under pressure, a valve assembly disposed within the conduit to control the flow of water delivered to said bowl, said valve assembly including a body having an inlet connected to said conduit and having a central chamber communicating with said inlet through an inlet passage, said body also having a downwardly facing discharge outlet communicating with said chamber, a valve member to open and close the inlet, a plunger connected to the valve member and extending through said inlet passage and through said chamber and projecting outwardly of said body at a location opposite said inlet and defining an actuating member, the portion of the plunger disposed within said inlet passage being spaced inwardly of said inlet passage to provide a clearance therebetween, the portion of said plunger disposed within said chamber having a laterally extending annular shoulder, depressing of said actuating member acting to open said valve member to discharge water through said clearance into said chamber, said shoulder deflecting the water and reducing the velocity of the water being discharged through the outlet of said bowl.

4,538,792

LOADING DOLLY

Lawrence E. Fielding, Enon, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 8, 1983, Ser. No. 512,062
Int. Cl.³ B60P *1/48*
U.S. Cl. 259—8 R **4 Claims**



1. A dolly for loading a component, such as an electronic countermeasure pod, on an aircraft, comprising:

(a) a generally rectangular frame having a pair of elongated side members and a pair of end members interconnecting said side members

(b) support assemblies mounted on said side members and being pivotable between adjacent upright positions for mounting said component on said frame and remote lateral positions for dismounting said component from said frame;

(c) a pair of mobile carriages disposed adjacent each end member of said frame, each carriage including

(i) a wheel,

(ii) a support block, and

(iii) a bracket rotatably mounting said wheel about a generally horizontal axis, said bracket, in turn, being rotatably mounted to said block about a generally vertical axis such that said wheel is capable of caster-like motion relative to said support block;

(d) a pair of linkage sets disposed adjacent each end member of said frame, each linkage set articulately interconnecting one of said mobile carriages of said pair thereof with its respective end member, disposing said one carriage in spaced relationship from the other of said mobile carriage of said pair thereof and aligning said one carriage with the elongated extent of one of said side members of said frame, each linkage set including

(i) a pair of spaced mounting plates fixed to and extending from said one end member in alignment with said one side member,

(ii) an upper elongated drive arm journaled at one end between said mounting plates and at the other end to said support block of said one carriage, and

(iii) a pair of lower guide links each journaled at one end to said mounting plates and at the other end to said support block so as to extend parallel to said upper drive arm,

(iv) said pair of mounting plates, upper drive arm, lower guide links and said support block of said carriage forming a four-bar linkage which, upon movement between extended and retracted positions, causes generally rectilinear vertical movement of said frame between raised and lowered positions relative to said one carriage; and

(e) a pair of lift mechanisms disposed adjacent each end member of said frame, each mechanism coupled between one of said linkage sets and its respective end member, said lift mechanism including

(i) a bell crank having spaced apart opposite ends and being pivotally mounted at a location intermediate its ends between said pair of mounting plates of said one linkage set,

(ii) a rod extension pivotally connected at one end to said drive arm of said one linkage set and at an opposite end to one end of said bell crank, and

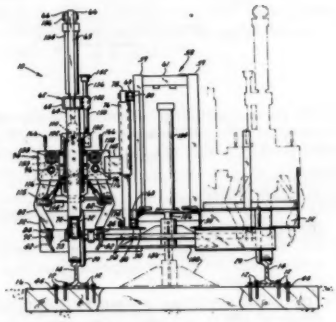
(iii) a screw jack horizontally disposed and stationarily mounted between said pair of mounting plates of said one linkage set and having an extensible and retractible screw shaft pivotally connected at its end to the other end of said bell crank and a drive wheel which is rotatable for causing extension and retraction of said screw shaft in a generally horizontal direction whereby extension of said screw shaft causes actuation of said four-bar linkage to its extended position, while retraction of said screw shaft causes actuation of said four-bar linkage to its retracted position.

4,538,793

DUAL CLAW SPIKE PULLER

Andrew M. Dieringer, Waterford, and Ervin M. Sheperd, Milwaukee, both of Wis., assignors to Rexnord Inc., Brookfield, Wis.

Filed May 29, 1984, Ser. No. 615,010
Int. Cl.³ B25C *11/00*; B66F *15/00*
U.S. Cl. 254—18 **14 Claims**



1. A machine for use in pulling spikes from railroad ties wherein spikes are driven into railroad ties on opposite sides of a rail, and the spikes each include a head, the machine comprising

a machine frame,

wheels for supporting the machine frame for movement along railroad tracks,

an engine supported by the machine frame for driving at least one of the wheels,

a pair of claws supported by the machine frame, one of the

claws being positioned on one side of the rail and for pulling spikes on that side of the rail and the other of the claws being positioned on an opposite side of the rail and for pulling spikes on that side of the rail, each of the claws including a lower end portion having a pair of spaced fingers extending inwardly toward the rail, each claw being supported for movement from a retracted position to a position wherein the fingers of that claw are positionable under the head of a spike on opposite sides of the spike, and

further including means for supporting the claws for movement from the retracted position downwardly and inwardly toward the rail into a position wherein the claws engage spikes and then move upwardly to pull the spikes from the tie.

4,538,794

SAMPLING MOLTEN METAL

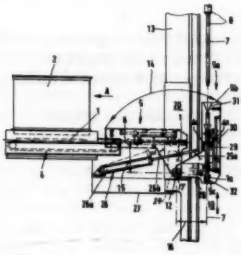
Helmut Scherff, Neukirchen-Vluyn, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,261

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3214898

Int. Cl.³ C21B *7/24*

U.S. Cl. 266—79 **13 Claims**



1. Apparatus for handling sampling tubes in relation to a metallurgical vessel and measuring lance movable in a vertical measuring axis in relation to said vessel for temporarily placing a sampling tube into the vessel and retrieving it thereform, comprising:

a manipulator mounted for pivoting on a horizontal axis;

releasable means on the manipulator for holding a sampling tube such that the tube is coaxial with that measuring axis when that manipulator is in an upright pivot position, and directly above the metallurgical vessel, said releasable means releasing the tube when in the vertical position for connection of the tube to the lance, the tube being coaxial with a delivery axis when the manipulator is pivoted into a horizontal axis; and

stationary means for moving a fresh tube in and along said delivery axis for being held by said releasable means.

4,538,795

DEVICE FOR INTRODUCING GAS INTO MOLTEN METAL IN CONTROLLED STREAMS

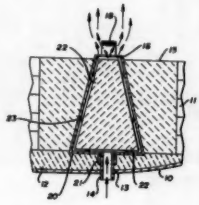
Michael D. La Bate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Oct. 19, 1984, Ser. No. 662,831

Int. Cl.³ C21C *5/48*

U.S. Cl. 266—220 **3 Claims**

1. In a device for introducing gas into a mass of molten metal, the improvement which comprises a solid body of refractory material and a shell positioned thereabout in spaced relation thereto and defining an opening around and above said solid body, a deflector positioned above said solid body and attached to said shell, a pocket block having a passageway extending vertically therethrough, said pocket block adapted to form a portion of a refractory lining in a container for said molten metal, said container having an opening therein in registry with said passageway in said pocket block, said solid body and said shell positioned in said passageway in said pocket block with said deflector extending outwardly of and



above said passageway in said pocket block in at least partially covering relation to said solid body and shell and facing the interior of said container so as to form more than one stream of gas rising in said molten metal when said gas is introduced through said device.

4,538,796

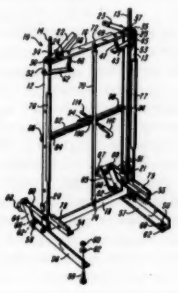
DOLLY

George L. Steck, Dayton, Ohio, assignor to Steck Manufacturing Co., Inc., Dayton, Ohio

Continuation of Ser. No. 402,212, Jul. 26, 1982, abandoned. This application Sep. 18, 1984, Ser. No. 652,159

Int. Cl.³ B25B *11/00*

U.S. Cl. 269—17 **11 Claims**



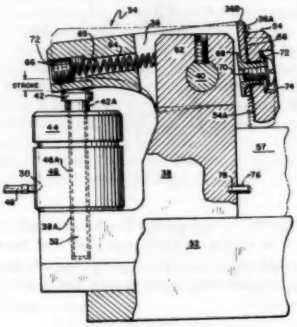
1. A dolly for transporting and positioning a load comprising a rectangular frame member having side portions and having brace portions fixed to said side portions and holding said side portions in spaced apart relation, said side portions comprising angle bars each having a closed corner and including friction jack means disposed in said closed corners, each jack means having a jacking rod cradled in its closed corner, foot portions affixed to said frame member and underlying said spaced apart side portions, said foot portions having rounded head portions at the underside thereof for engaging and seeking positions of stability upon an underlying floor to which said head portions transfer the weight of said dolly and any load supported thereby, said foot portions projecting forwardly of said frame and having heel portions projecting rearwardly of said frame and inclined upwardly from said foot portions, and including a roller for each of said heel portions and means mounting said rollers to said portions for rolling movement of said rollers after tilting said frame to transfer the weight of said frame and any load supported thereby to said rollers.

4,538,797

ADJUSTABLE HYDRAULIC DIE CLAMP

Orville L. Lerch, Chicago, Ill., assignor to CLEARING, a division of U.S. Industries, Inc., Chicago, Ill.

Filed Jul. 8, 1983, Ser. No. 511,836
Int. Cl.[3] B60G *11/34*
U.S. Cl. 269—27 13 Claims



1. A hydraulic clamp mounted to a work surface and coupled to a source of hydraulic pressure for securely attaching a die assembly to said work surface, said clamp comprising:

a body securely mounted to said work surface;

a lever having first and second end portions and an intermediate portion pivotally coupled to said body;

hydraulic displacement means coupled to said source of hydraulic pressure and responsive to changes in pressure and further coupled to the first end portion of said lever for displacing said first end portion in response to changes in said pressure;

engaging means for engaging and securely mounting a die assembly positioned on said work surface;

coupling means for mounting said engaging means in position upon the second end portion of said lever; and

resilient means cooperating with said coupling means for urging said engaging means towards and in secure engagement with the second end portion of said lever, wherein said resilient means is adapted for displacement away from the second end portion of said lever to allow for disengagement of said engaging means from said lever whereby the displacement between said engaging means and said work surface may be selectively varied to accommodate a range of thicknesses of said die assembly by changing the position of said engaging means on the second end portion of said lever while maintaining secure coupling between said engaging means and said lever.

4,538,798

FRAME FOR CONSTRUCTING A HEMISPHERICAL MULTI-LAYERED SHELL

Raymond E. Pechacek, Houston, Tex., assignor to Hahn & Clay, Houston, Tex.

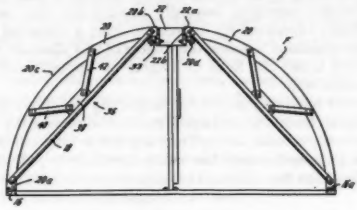
Division of Ser. No. 262,422, May 11, 1981, Pat. No. 4,403,387.
This application May 2, 1983, Ser. No. 490,562
Int. Cl.[3] B23Q *3/00*
U.S. Cl. 269—289 R 6 Claims

1. A jig frame for constructing a hemispherical multi-layered shell, comprising:

an annular ring-shaped base plate with a bottom surface and a top surface;

a plurality of arc portions cut from an annular ring-shaped plate congruent to said annular ring-shaped base plate and having an outer radius of curvature equal to the outer radius of curvature of said base plate, each with a first end and a second end;

said plurality of arc portions mounted and detachably secured by said first ends to said upper surface of said base plate equally circumferentially spaced and radially directed; and



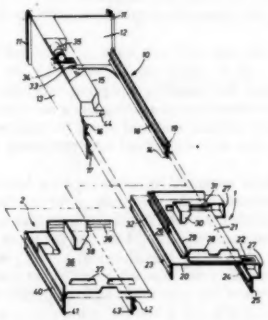
said second end of said arc portions being attached to the outer surface of a central collar whereby said arc portions are readily detachable from said base plate after manufacturing said shell on said frame.

4,538,799

SHEET FEEDING APPARATUS

Anil G. Bhagwat, Hemel Hempstead, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 20, 1983, Ser. No. 534,054
Claims priority, application United Kingdom, Sep. 21, 1982, 8226807
Int. Cl.[3] B65H *1/26, 3/06*
U.S. Cl. 271—9 3 Claims

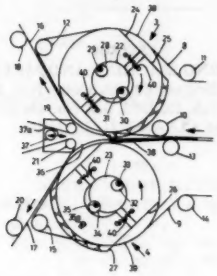


1. Sheet feeding apparatus comprising a frame, a tray carriage mounted for vertical movements in the frame, a plurality of tray assemblies for holding respectively a plurality of stacks of sheets, the tray asemblies being carried one above another by the tray carriage and being arranged for independent slideable withdrawal from the tray carriage in a first horizontal direction; and a frictional feeder device in a fixed location for top-feeding sheets in a sheet feed direction from any selected one of the stacks; at least one of the tray assemblies comprising a sub-frame and a tray, the tray being slideably mounted on the sub-frame for movements thereover in a second direction parallel with the sheet feed direction and perpendicular to the first horizontal direction: and wherein the tray of said at least one of the tray assemblies is moved over the subframe by means of a grooved member mounted in the tray carriage and arranged so that the groove in said member is engaged by a catch member mounted on the tray.

4,538,800
PRINTED COPY SEPARATING AND ROUTING MECHANISM

Johannes Richter, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,412
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210203
Int. Cl.³ B65H 3/06
U.S. Cl. 271—120 14 Claims



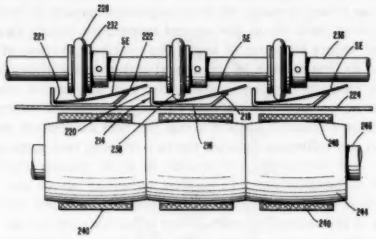
1. Printed copy separating and routing mechanism having a pair of rotating cylinders (3, 4);
means (10–15) feeding copy elements (38) to the cylinders;
receiving means (36) defining two alternate receiving paths into which the copy is selectively guided, or alternate copy elements are alternately guided,
comprising
a segmental element (25, 27) located on the circumference of each of the cylinders (3, 4) and positioned in the path of the copy which passes between the cylinders, to deflect the copy into the first path, or the second path, or, alternately, copy elements into the first and second paths, respectively,
the position of the segments and the rotary speed of the cylinders (3, 4) being matched to the spacing of the arriving copy to effect such deflection into the respective paths;
and means for controlling the position of the segmental elements in relation to the circumference of the respective cylinder comprising eccentric positioning means (28–31; 32–35) selectively projecting respective segmental elements out of the circumference of the respective cylinder, or retracting the respective segmental elements to a non-projecting position from a cylindrical circumference defined by said cylinders (3, 4) whereby, upon projection of the respective elements, the segments will be placed into the path of transport of the copy (38) and deflect the transport path of the copy from a tangential path between the cylinders to a selected one of said first or second paths.

4,538,801
PAPER SHEET HANDLING MECHANISM

Christopher K. Van Pelt, Venice, Fla., assignor to Therm-O-Type Corporation, Nokomis, Fla.

Filed Jun. 9, 1982, Ser. No. 386,602
Int. Cl.³ B65H 5/02, 9/16
U.S. Cl. 271—251 8 Claims

1. A mechanism for handling paper comprising a plurality of fore-aft extending guide members each including side walls so as to form a channel and means for supporting a segment of paper along at least two laterally spaced lines of support, a first of said lines of support being a sidewall and another being located within the channel and vertically offset from said first line of support, and a plurality of movable driving means disposed above respective ones of said guide members and arranged to bear against said paper segments intermediate all lines of support for deflecting said segments downwardly and

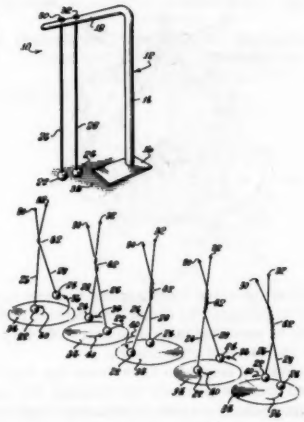


effecting a frictional driving engagement therewith in said fore-aft direction.

4,538,802
ENERGY ALTERNATING SWING METHOD

John W. Van John, 2953 Waterfield Dr., Sparks, Nev. 89431

Filed Jun. 15, 1981, Ser. No. 273,331
Int. Cl.³ A63F 9/00
U.S. Cl. 272—1 R 1 Claim



1. The method of transmitting energy and motion between two suspended objects comprising: fastening a first object having a given weight and shape to the first end of a first elongated flexible suspension means having two ends; fastening the second end of the said first suspension means to a first position on a fixed suspension device at a distance above a base level; fastening a second object having the same weight and shape as the first object to the first end of a second elongated flexible suspension means which is a duplicate of the first suspension means; fastening the second end of said second suspension means to a second position on said fixed suspension device in such manner that the two objects are at the same elevation above the base level and the two suspension means are parallel and in close proximity to each other; imparting a freely moving circular motion to the first object in such manner that the first object circles about the second suspension means while the second object is unrestricted and remains essentially at rest, in such manner that in so circling, the first object cause the first suspension means to encircle and entwine the first suspension means about the second suspension means; causing the first object to cease its circular motion naturally, and without interference exterior to the two object and the

two suspension means and the suspension device; causing the first object to move in a circular motion opposite to its original circular motion without interference exterior of the two objects, the two suspension means, and the suspension device, and in so doing causing the first suspension means to become disentwined from about the second suspension means; causing the first object to come to rest in its original position of rest prior to its first motion by its natural action and without interference exterior the two objects, the two suspension means, and the suspension device; and causing the second object to commence a circular motion about the first suspension means without any influence exterior the two objects, two suspension means, and the suspension device in such manner that the second suspension means becomes entwined about the first suspension means by means of a naturally induced circular motion of the second object without influence exterior the two objects, the two suspension means, and the suspension device.

4,538,803

WORKING MUSICAL CAROUSEL KIT WITH ROCKING FIGURES

Adolph E. Goldfarb, 1432 S. East Wind Cir., Westlake Village, Calif. 91361

Filed Feb. 10, 1984, Ser. No. 579,208
Int. Cl.³ A63H *13/20*
U.S. Cl. 272—31 R **1 Claim**

1. A carousel powered from a music box and having figurines animated primarily by simple, inexpensive parts adapted for assembly by untrained individual owers of "do-it-yourself" hobby kits; the carousel comprising:

a base defining a recess for such music box and having an elevated annular platform surrounding the recess, the platform defining a series of relatively short holes in a circular pattern whose center is at the center of rotation of the carousel;

a commercial music box mounted in the base;

a carousel deck supported, for rotation in a generally horizontal plane above the platform from an output shaft of the music box;

a pillar upstanding from the center of the carousel deck having openings each serving as a bearing;

upstanding bearing posts supported from the carousel deck outward of the pillar and rotating with the carousel deck, each post defining an opening, spaced above the deck, that serves as a bearing;

the deck defining a relatively long slot adjacent each bearing post spaced from the center of rotation of the carousel deck by an amount approximately equal to the radius of the said circular pattern of relatively short holes in the platform;

shafts each supported substantially horizontally between one of the respective bearings in the bearing posts and one of the respective bearings in the pillar, and rotatable relative to its two bearings, and relative to its post and the pillar, and relative to the carousel deck;

a crank keyed to each shaft and depending therefrom through its respective relatively long slot and into contact with the platform;

whereby during rotation of the carousel the crank falls into the short holes when the leading edge of each short hole comes into position below the slot, and the crank rises when the trailing edge of each short hole comes into position below the slot, which oscillation of the crank is transmitted to the shaft, causing the shaft to oscillate in rotation relative to the bearings, post, pillar, and deck; and

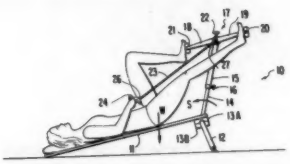
a figurine secured to the end of each shaft and oscillating with the shaft as the carousel rotates.

4,538,804

EXERCISING MACHINE AND METHOD

J. Scott Zibell, 40 Brittany Ct., Charlotte, N.C. 28226

Filed Feb. 25, 1983, Ser. No. 469,853
Int. Cl.³ A63B *21/22, 23/04*
U.S. Cl. 272—73 **7 Claims**



1. An exercise machine comprising, in combination,

a rigid body supporting platform, means for supporting one end of said platform at a level such that it is inclined at an angle to the horizontal, said means supporting said one end of said platform including a U-shaped tubular frame member having a horizontal bar and a pair of legs,

a standard mounted on one end of said rigid body supporting platform,

means securing said standard to said U-shaped frame member at an angle other than 180 degrees,

a pair of crank and pedal means, hub means for rotatably mounting said pair of crank and pedal means on the end of said standard, and

means rotatably mounting said horizontal bar of said U-shaped frame on the underside of said rigid supporting platform such that a downward weight on the upper side of said platform urges said standard toward the weight and the legs of said U-shaped member away from said weight.

4,538,805

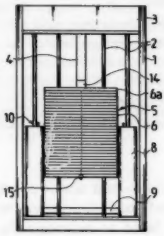
COUNTER-ACTION DEVICE FOR EXERCISE DEVICE

Arno Parviainen, P.O. Box 1, SF-00601 Helsinki 60, Finland

Filed Oct. 27, 1983, Ser. No. 546,169
Claims priority, application Finland, Jul. 27, 1982, 822620
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—118 **6 Claims**

1. An exercise device, comprising a frame, guide means mounted on the frame, a transmission mechanism including connecting means, a stack of weight slabs mounted for movement relative to said frame on said guide means, the uppermost slab of said stack being attached to said connecting means and the remaining slabs in said stack being selectively removably connected to said connecting means, a supplemental weight disposed on each side of said stack of weight slabs and mounted for movement relative to said frame on said guide means, and locking means for selectively locking each of the supplemental weights to said uppermost slab, a selected number of said slabs

being adapted to serve as counterweight for physical exercise and said supplemental weights being selectively connectable to



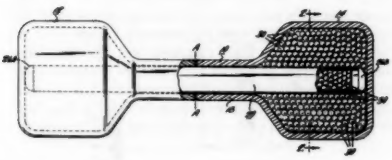
said uppermost slab to increase the magnitude of said counterweight.

4,538,806

EXERCISER DUMBBELLS

C. William Wilkerson, Raleigh, N.C., assignor to Campbell Soup Company, Camden, N.J.

Filed Sep. 29, 1983, Ser. No. 537,271
Int. Cl.³ A63B *11/00*
U.S. Cl. 272—122 **7 Claims**



1. An exercise dumbbell, comprising a grip portion and a pair of bells one at each end of the grip portion, wherein:

each of said bells and an adjacent portion of said grip portion consists of a soft pliable outer covering, said adjacent portions being in abutting engagement and forming the entire grip portion, whereby said dumbbell is substantially completely covered by said pliable outer covering, each of said bells having an imperforate outer surface and being filled with a dense yieldable mass of particulate weighting material, said covering and said yieldable mass being insufficently rigid to maintain the configurational integrity of said dumbbell, and

said dumbbell comprises a rigid axial support means covered by said soft pliable outer covering and extending axially through said grip portion substantially to the interior end walls of said bells and being free of attachment to said end walls.

4,538,807

TORSO BUILDING EXERCISE MACHINE

Max Rice, San Francisco, Calif., assignor to The Max Rice Corporation, Seattle, Wash.

Filed Jul. 6, 1984, Ser. No. 628,485
Int. Cl.³ A63B *23/02*
U.S. Cl. 272—146 **16 Claims**

1. A torso building exercise machine comprising:

(a) a stationary base means;

(b) a horizontally disposed generally circular rotatable turntable means mounted generally centrally of said base means, said turntable means having a single degree of freedom about its vertical axis;

(c) adjustable weight means located near the periphery of said turntable means; and

(d) a single upright stationary stanchion means mounted on and upstanding at one side of said base means, said stanchion means carrying a continuous, wide, curvilinear array of horizontally extending handhold means at various vertical levels at one side of said turntable means such handhold means being arranged generally concentrically

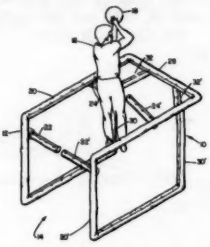
of the axis of rotation of said turntable means so as to be selectively grippable by a person with arms forwardly extended while performing various torso twisting exercises on the turntable means.

4,538,808

DEVICE FOR TRAINING BASKETBALL PLAYERS TO SHOOT

Hugh H. Holland, 201 W. South Third, Shelbyville, Ill. 62565

Filed Mar. 5, 1984, Ser. No. 586,340
Int. Cl.³ A63B *69/00*
U.S. Cl. 273—1.5 A **5 Claims**



1. A basketball training device for training basketball players to shoot while contacted or resisted by the arms of other players comprising a framework defining a cage and an opening into the cage, the cage being of sufficient dimensions for allowing a player therein to shoot from the cage, the framework carrying first and second pairs of resilient, forcibly yieldable arm-simulative members, the first pair of arm-simulative members extending inwardly toward one another from opposite sides of the entrance at a height sufficient for permitting the player to dribble a basketball through the opening, but sufficiently blocking the entrance as to resist the player in forcibly yieldable relationship in moving through the entrance, the second pair of arm-simulative members extending inwardly of the cage toward one another from opposite sides of the cage but displaced horizontally from, and vertically located at a greater height than, the first pair of arm-simulative members for resisting the player in forcibly yieldable relationship when jumping to the shooting position, whereby the training device is simulative of arm resistance and body contact during actual basketball play, the framework being formed of side frames defining the sides of the cage, the side frames being joined together only by a horizontal member extending across the entrance-remote end of the cage, whereby there is no interven-

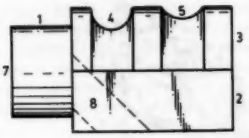
ing structure for interfering during movement of the player relative to the cage or with dribbling or handling of the basketball.

4,538,809

MECHANICAL BRIDGE AND CHALK HOLDER

Wayne Boomer, 3407 Spenard Rd. #1, Anchorage, Ak. 99503

Filed Dec. 2, 1983, Ser. No. 557,616
Int. Cl.[3] A63D *15/00*
U.S. Cl. 273—18 **8 Claims**



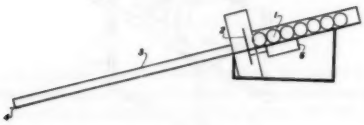
1. A mechanical Bridge and chalk holder comprising:
(a) A support block;
(b) A bridge portion, fixedly attached to said support block, having at least one groove transversely placed therein said groove having a generally curved shape and being sized to support an average cue stick;
(c) A cylindrical flexible tube portion, fixedly attached to one end of said support block-bridge portion combination for the purpose of storing cue chalk.

4,538,810

BASEBALL DISPENSER DEVICE FOR BATTING PRACTICE

Arthur M. Brophy, 2043 Madison St., Hollywood, Fla. 33020

Filed Jul. 29, 1981, Ser. No. 262,687
Int. Cl.[3] A63B *69/40*
U.S. Cl. 273—26 D **5 Claims**



1. A ball dispensing machine comprising an elongated sloping ball container, said container having a ball entrance end, a ball exit end and a ball release means at said exit end for gravitationally receiving balls from said entrance end; a ball chute sloping downward and outward from said ball container and having one of its ends attached to said ball release means; spring means attached to the other end of said chute, said ball release means releasing balls singularly and at timed intervals to said chute and causing them to gravitationally roll down said chute to said other end to contact said spring means for deflection upward to be hit by a batter.

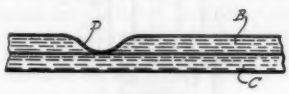
4,538,811

ARBITRATION OF TENNIS BY CHANGE OF COLORS

Luis T. Wigoda, 345 North Shore Dr., Miami Beach, Fla. 33141

Filed Mar. 7, 1983, Ser. No. 457,933
Int. Cl.[3] A63C *19/06*
U.S. Cl. 273—31 **1 Claim**

1. A tennis ball contact indicator in combination with a tennis court comprising:
a thin rectilinear conduit having a transparent and flexible top layer and a bottom layer of one color;
said top layer including a tear and wear resistant material in the form of a rectilinear line;
a high density fluid having a color different from said one color and being flowable upon movement of said top layer;
said top layer and bottom layer being separated by one millimeter or more; and



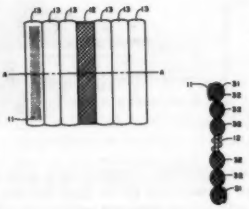
said conduit being affixed to said tennis court to define the boundary thereof and said top layer being movable towards said bottom layer to momentarily displace said fluid and expose said one color upon impact of a tennis ball with said top layer to indicate out of bounds of a tennis ball during play.

4,538,812

WEIGHT DEVICE FOR ATHLETIC RACKET

David B. Mugford, 137 Essex St., Chelsea, Mass. 02150, and Sidney J. Guidicianne, 31 Old Country Rd., Saugus, Mass. 01906

Filed Feb. 22, 1982, Ser. No. 350,992
Int. Cl.[3] A63B *49/00*
U.S. Cl. 273—73 R **4 Claims**



1. The combination of an athletic racket having a tubular member, with a weight device for detachable affixation to such athletic racket, said device comprising:
first and second flexible sheets, said first sheet and said second sheet each having first and second sides, said first sides comprising non-slip surfaces having a high coefficient of friction with respect to the surface of the tubular member;
at least one weight attached to each flexible sheet;
an elastic member distinct from the non-slip surface and integrally attached to the first and second sheets for elastically separating the sheets into two weight-bearing portions which by stretching of the elastic member may be variably spaced apart from each other so as to position the weights on substantially opposing sides of the racket while tensioning the sheets; and
latch means, for removably latching the first and second sheets together into a physically closed loop around the tubular member so as to maintain the elastic tension of the sheets while frictionally securing the weights in opposing balanced positions around the racket.

4,538,813

CARD HOLDER

Raymond J. Pergeau, 17624 N. 38th Ave., Glendale, Ariz. 85308

Filed Feb. 10, 1983, Ser. No. 578,962
Int. Cl.[3] A63F *1/10*
U.S. Cl. 273—150 **8 Claims**

1. An apparatus for holding a plurality of playing cards of

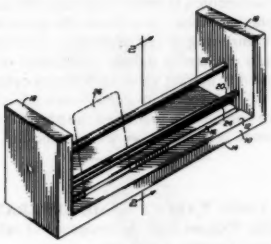
the type having a back surface and a front surface, said front surface having visible indicia thereon, and for displaying said cards in a visually discernible and selectively individually retrievable array, said apparatus comprising:

a base having an upper surface;

first and second side members coupled to opposite ends of said base and extending upwardly therefrom;

a first elongate member coupled between said first and second side members above said surface;

a second elongate member coupled between said first and second side members above said first elongate member and to the rear thereof; and



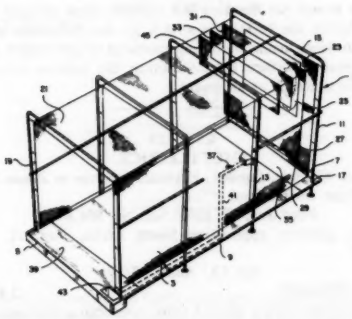
a third elongate member coupled between said first and second side members and positioned slightly below and to the rear of said first elongate member, said third elongate member being spaced from said first elongate member so as to permit a plurality of overlapping playing cards to pass between said first and third elongate members, said first elongate member for engaging an intermediate portion of said playing card along the front surface thereof, and said second elongate member for engaging an upper portion of said playing card along a back surface thereof.

4,538,814

TRIFUNCTIONAL GOLFING CAGE

William J. Cunningham, P.O. Box 888, Hackettstown, N.J. 07840

Filed Sep. 4, 1984, Ser. No. 646,781
Int. Cl.³ A63B *69/36, 57/00*
U.S. Cl. 273—176 F **20 Claims**



1. A trifunctional golfing cage comprising:

(a) an elongated, flat playing surface constituting a base having a front, a back and sides, and being at least 8 feet wide and 15 feet in length;

(b) a free standing frame having a plurality of side members and a plurality of top members at least 10 feet in height, said frame being connected to said base;

(c) a first netting having a weave and strength fine enough to contain a driven golf ball, said netting constituting a continuous closure connected to said frame and enclosing said base from above, on its sides and to its back said frame and said first netting thereby comprising sides, back and top portions of said cage;

(d) a second netting hanging from the top portion of said cage and located above said base, said second netting having a width approximately equal to the width of said base and having a hanging length of at least 75% of the first netting height, said second netting being unsecured at its bottom and having weights contained at its bottom of sufficient mass to substantially slow down or stop a driven golf ball, said second netting being located at least six inches in front of the back portion of said first netting such that the second netting and first netting acting together will stop a driven golf ball, said second netting thereby constituting a driving loose drop netting;

(e) a third netting hanging from the top portion of said cage and located above said base and having a hanging length of no more than 35% of the first netting height, said third netting being unsecured at its bottom and being located at least six inches in front of said second netting such that the third netting acting alone will stop or deflect substantially downwardly a chipped golf ball, thereby constituting a chipping loose drop netting;

(f) a receiving trough located at the back of said base to receive hit golf balls which drop from said netting;

(g) a cup located in said base away from the front of said base so as to constitute a putting hole; and,

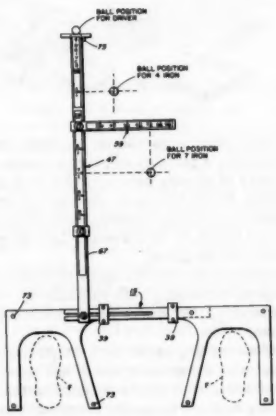
(h) a tee off area at the front of said base located so as to permit driving, chipping and putting.

4,538,815

GOLF STANCE GUAGE

Ronald G. Poirier, 56 Harbor Ave., Nashua, N.H. 03060

Filed Apr. 25, 1984, Ser. No. 603,728
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—187 R **5 Claims**



1. A golf stance guage for use in assisting a golfer in learning the proper stance and distance from a golf ball for a variety of differnt golf clubs comprising:

a. a foot positioning frame adapted to rest on the ground, said foot positioning frame being adjustable in length and comprising a left frame section, being adjustable in length and comprising a left frame section, a right frame section and removable means for securing said two frame sections together, each frame section having an integrally formed open ended fixed foot receiving opening,

b. a first elongated ball marker member extending outward from said foot positioning frame, said first ball marker

member having an inner end and an outer end and being adjustable in length,

c. means for pivotally attaching the inner end of said first ball marker member to said foot positioning frame at either one of two locations depending on whether the golfer is left handed or right handed and

d. a second elongated ball marker member slidably mounted on said first ball marker member and extending laterally outward therefrom at right angles thereto,

e. indicia recording means on said first and second ball marker members,

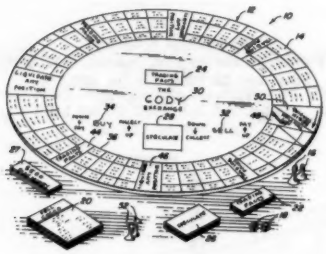
f. whereby, said golf ball can be properly positioned longitudinally and laterally relative to said foot positioning frame for different golf clubs using said first and second ball marker members to record the desired position of said ball about two mutually perpendicular axes and then said first and second ball marker members pivoted out of the way so as to not be hit by the club of the golfer during his swing.

4,538,816

COMMODITIES TRADING GAMES OF SKILL AND CHANCE

Carlos A. Figueroa, 41 Townsend Ave., Staten Island, N.Y. 10314

Filed Oct. 17, 1983, Ser. No. 542,418
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—256 **13 Claims**



1. A board game apparatus for a commodities trading game to be played by a plurality of players, comprising:

a plurality of playing pieces-one for each player;

a playing board having a plurality of defined sequential spaces constituting a playing path about the outer margin of said board, to be traversed by said pieces during the playing of the game;

means associated with the majority of said sequential spaces uniquely identifying each, respectively, with the trade of a commodity, said spaces being referred to as commodity spaces;

a set of commodity cards, each uniquely identified to correspond with a respective one of said commodity spaces for presentation to a player transacting the trade of a commodity referred to on the commodity space on which a playing piece lands, there being an equal number of commodity cards, and commodity spaces;

a commodity market value associated with each of said commodity cards;

first and second means associated with said commodity spaces to divide said commodity spaces into respectively two different classes of commodity spaces, said two classes of commodity spaces being interposed with each other about the playing path, corresponding first and second other means associated with said commodity cards correspondingly dividing said commodity cards into two corresponding classes of cards, there being an equal number of spaces of each class;

means associated with other of said sequential spaces identifying them with an identical chance card indicator, such spaces being referred to as fact spaces;

a set of chance selection fact cards, each uniquely identified with a commodity investment fact situation, each player drawing one of said fact cards, when its playing piece lands on a fact space;

chance determining means for indicating a number of said sequential spaces in said playing path to be traversed by that player's playing piece in one turn;

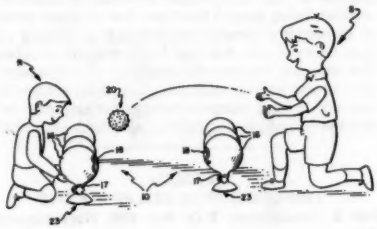
play money for distribution to the players, whereby each player can trade in commodities by buying and selling future contracts of the commodities, options, and the actual commodities, in order to increase his initial distribution of playing money to achieve the greatest profit, and further comprising a set of chance selection speculate cards, each containing indicia an increase or decrease in the commodity market value each player optionally drawing one of said speculate cards when his playing piece lands on a commodity space and the player is not transacting the trade referred to on that commodity space.

4,538,817

BALLOON TARGET GAME APPARATUS

Joseph Ramella, Welland, Canada, assignor to Louis E. Bonomi, St. Catherines, Canada, a part interest

Filed Aug. 6, 1984, Ser. No. 638,259
Int. Cl.³ A63F *9/02*
U.S. Cl. 273—380 **11 Claims**



1. In a balloon target game apparatus including an inflated balloon and a throwable article for throwing at the inflated balloon, the improvement comprising:

abrasive means for bursting the balloon upon contact therewith when the balloon is struck by the throwable article, said abrasive means including particles of grit which define an abrasive surface for contacting the balloon when the balloon is struck as aforesaid.

4,538,818

SHUTTLECOCK

J. Andrew Sinclair, London, England, assignor to Zimm Zamm AG, Baar, Switzerland

Filed Jun. 21, 1983, Ser. No. 506,474
Claims priority, application South Africa, Jun. 21, 1982, 82/4359
Int. Cl.³ A63B *67/18*
U.S. Cl. 273—417 **2 Claims**

1. A shuttlecock for use in a game resembling badminton but which, to the usual characteristics of badminton of returing the shuttlecock through the air by striking it with a racquet before the shuttlecock has touched he ground, adds the unusual characteristic of returning the shuttlecock through the air by striking it with a racquet after the shuttlecock has touched once on the ground and has rebounded to a striking height, similar to the usual characteristic of tennis ball rebounding and play in the usual game of tennis,

said shuttlecock comprising:

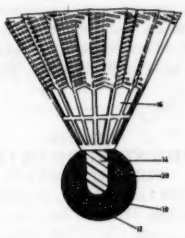
a head which is substantially spherically curved throughout a substantial portion of the external periphery thereof

including throughout a forward, nose portion and an axially intermediate portion; and

a skirt member including a relatively thin-walled rearwardly flaring generally frusto-conical skirt with a head core portion secured at a forward end thereof;

said head including an axially rearwardly opening socket in a trailing portion thereof, said socket extending axially forwardly within said head along the longitudinal axis of said shuttlecock, to a level located at least approximately half-way through the head;

said head core of said skirt member being secured in said socket so that said skirt extends coaxially rearwardly from



said trailing portion of said head as a skirt for said shuttlecock;

said head being made of closed-cell polmeric foam having an average cell size of 0.3–0.7 mm, a tensile strength of 250–400 kn/m^2, an elongation at break of 100–300 percent, a density of 0.03–0.075 gm/cm^3, a Shore hardness of less than 15, and a diameter of 5–15 cm;

said head core having a density of 0.8–0.9 gm/cm^3, and a diameter of 1.5–4.0 cm; and

said head core and said head together constituting a head assembly having an overall mass of 15–30 gm, and a mean density of 0.10–0.2 gm/cm^3.

4,538,819

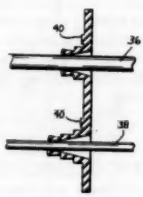
LEAD GASKET FOR ELECTRIC MOTORS

Paul D. Wagner, Cincinnati, and Edward F. Cooney, Norwood, both of Ohio, assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Sep. 19, 1980, Ser. No. 188,900

Int. Cl.³ F16J *15/16*

U.S. Cl. 277—4 **3 Claims**



1. An improved gasket for providing a tight seal between the enclosure of an electric motor and the leads extending therefrom, comprising:

a generally planar member extending across an opening in the enclosure for engaging the edges thereof to provide a seal;

a plurality of generally conical lead bushing members extending generally perpendicularly to said planar portion and spaced from the edges thereof; .

said bushings being severable at a plurality of planes along the length thereof to each thereby provide a generally resiliant, circular passage for sealingly engaging motor leads of different sizes extending through the opening in the motor enclosure;

the exterior of said lead bushing portions being provided with indicia comprising a graduated series of cylindrical surfaces along the length thereof for indicating appropriate points at which to be severed;

the interior surface of each of said bushings comprising a generally continuous, conical surface.

4,538,820

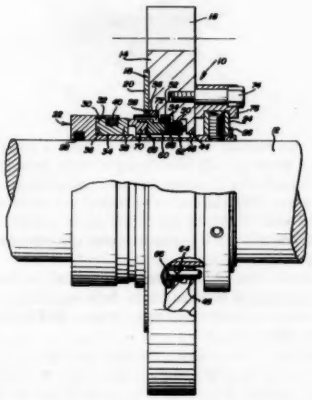
SHAFT SEAL

Henry S. Duffee, 1104 Wentworth Dr., Florence, S.C. 29501

Filed Jun. 23, 1983, Ser. No. 507,274

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—11 **3 Claims**



1. In combination with a stationary housing portion defining an opening therethrough and a shaft rotatable relative to said housing portion and projecting loosely through said opening, a seal assembly including an elongated sleeve slidably and rotatably mounted on said shaft and including first and second ends disposed on first and second sides of said housing portion, said first end of said sleeve defining a seal cavity concentric with said sleeve and opening axially along said sleeve toward said second sleeve end, a first annular seal stationarily mounted in said cavity with one axial face of said seal facing towards said second sleeve end and disposed normal to the axis of rotation of said shaft, first seal means establishing a fluid tight seal between said first sleeve end and said shaft, second seal means establishing a fluid tight seal between said sleeve and said seal, said housing portion defining an annular recess concentric with said shaft and opening axially thereof toward said first sleeve end, an annular seal holder loosely received in said cavity for radial as well as axial shifting therein, a second annular seal mounted from said holder and facing toward and abutting said first annular seal, means establishing a guiding connection between said annular seal holder and said housing portion keying said holder to said housing portions against rotation relative to said housing portion about the axis of rotation of said shaft while allowing axial shifting of said holder relative to said housing portion, sleeve and shaft, circumferentially spaced spring means yieldingly biasing said holder relative to said housing portion toward said first end of said sleeve, and means operative to key said sleeve to said shaft for rotation therewith and in adjusted axially shifted position on said shaft relative to said housing portion.

4,538,821

MECHANICAL SEALS

Neil M. Wallace, Stockport, England, assignor to Flexibox Limited, Manchester, England

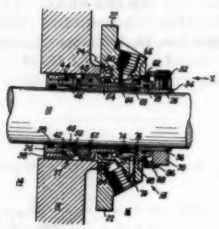
PCT No. PCT/GB83/00093, § 371 Date Nov. 18, 1983, § 102(e) Date Nov. 18, 1983, PCT Pub. No. WO83/03454, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 28, 1983, Ser. No. 555,880

Claims priority, application United Kingdom, Apr. 2, 1982, 8209790

Int. Cl.³ E16J *15/34*

U.S. Cl. 277—81 R 17 Claims



1. A mechanical seal adapted to seal a rotary shaft (10) exiting a housing (12) containing a fluid product (14) to be retained inside the housing, the seal comprising

(i) a sleeve (26) adapted to be sealed and secured around the shaft and extending out of the housing (12);

(ii) an annular rotary seal element (38,40) carried by said sleeve (26);

(iii) an end plate (22) adapted to surround the sleeve (26) and be sealed and secured to the housing (12);

(iv) an annular stationary seal element (52,54) carried by said end plate (22); and

(v) spring means (64) urging said seal elements (40,52) into contact at opposed annular seal surfaces (48,50) to form a running seal therebetween, characterised in that,

(vi) a multipurpose bush (60) is disposed in the end plate (22) outside of said seal elements (40,52) and which is a close fit on the sleeve (26) to staunch any leak between said seal elements (40,52) and which carries and positions the spring means (64),

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4,538,822

SEAL GASKET SPECIFICALLY CONFIGURED TO SEAL THE JOINT BETWEEN ADJACENT OVAL CONCRETE PIPES

Roger R. Beacom, P.O. Box 296, Venice, Fla. 33595

Filed Mar. 12, 1984, Ser. No. 588,734

Int. Cl.³ F16J *15/12*

U.S. Cl. 277—207 A 2 Claims

1. A seal gasket and oval concrete pipe combination wherein a plurality of oval concrete pipes each includes a male and female joint member formed on opposite ends thereof to operatively engage the corresponding joint member formed on the next adjacent oval concrete pipe wherein the male joint member includes an off-set recess of reduced diameter on the outer end thereof to receive said seal gasket; said seal gasket comprising a compressible member including a compressible frustro-conically shaped ring disposed to seat within said off-set recess of said male joint member having an inner compressible sealing element and a tapered outer compressible sealing element disposed in axially spaced relation relative to each other extending outwardly from the outer surface of said compressible frustro-conically shaped ring, the length of said inner compressible sealing element being less than the axially spacing between said inner compressible sealing element and said tapered outer compressible sealing element such that said inner compressible sealing element forms a seal between said compressible frustro-conically shaped ring and said female joint member and said tapered outer compressible sealing element forms a seal between said male and female joint members outwardly of said off-set recess, when adjacent oval concrete pipes are placed in operatively relationship relative to each other.

4,538,823

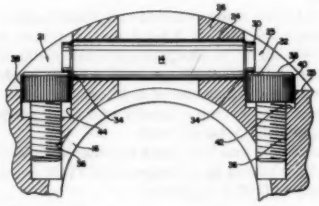
MEANS FOR MOUNTING CHUCK LEVER PINS IN A FULCRUM DEVICE

Robert C. Gunn, 222 Longhill Ave., Somerset, Mass. 02726

Filed Jun. 18, 1984, Ser. No. 621,849

Int. Cl.³ B23B *5/22*

U.S. Cl. 279—37 5 Claims



1. As assembly for mounting a pivotable member such as a chuck lever from a housing such as the head of a fulcrum holder, said head including trunnion means in turn having a laterally extending bore passing therethrough for receipt of a symmetrical cylindrically shaped pivot pin in turn having a smaller diameter axial extension projecting from each end surface thereof, said housing including laterally open surfaces adjacent opposite sides of said trunnion means, said open surfaces each having an initially counterbored inwardly extending threaded bore for receipt of a headed screw, said screw heads adapted to contact said pin extensions when said screws are upwardly moved thereby positively positioning said pivot pin in said trunnion means.

4,538,824

STEERING DEVICE FOR VEHICLE

Yoshimi Furukawa, Saitama, and Shoichi Sano, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,433

Claims priority, application Japan, Oct. 22, 1982, 57-185493; Oct. 22, 1982, 57-185494

Int. Cl.³ B62D *7/00*

U.S. Cl. 280—91 4 Claims

1. A steering device for a vehicle having front and rear wheels, comprising:

means for turning said front wheels, operatively connected to a steering wheel so as to turn said front wheels at a turning angle proportional to a steering angle of said steering wheel under an operation of said steering wheel;

means for turning said rear wheels, operatively connected to

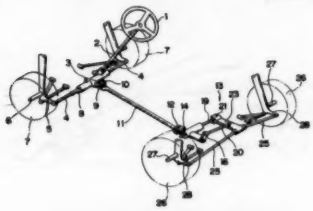
said steering wheel so as to perform a turning of said rear wheels in the same direction as that of said front wheels and in an opposite direction thereto, and with a turning angle corresponding to a steering angle of said steering wheel under an operation of said steering wheel; and

said means for turning said rear wheels comprising:

tie-rods for turning said rear wheels;

a rear wheel turning member connected to said tie-rods so as to turn said rear wheels by movement thereof;

an input member adapted to be rotated in proportion to a steering angle of said steering wheel;



a first transmitting means disposed between said input member and said rear wheel turning member so as to move said rear wheel turning member at a first rate corresponding to an amount of movement of said input member; and

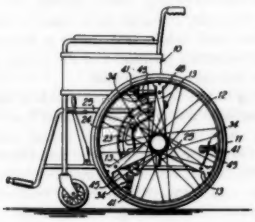
a second transmitting means disposed between said input member and said rear wheel turning member so as to move said rear wheel turning member at a second rate corresponding to an amount of rotation of said input member.

4,538,825

WHEELCHAIR ANTI-ROLLBACK MECHANISM

Ronald D. Delahoussaye, Ruston, La., and James W. Brazell, II, Atlanta, Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed Mar. 15, 1984, Ser. No. 590,429
Int. Cl.³ B62M 1/14
U.S. Cl. 280—242 WC **14 Claims**



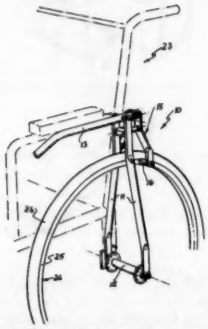
1. In a wheelchair, a main chair wheel, a manual propulsion ring disposed adjacent to said wheel, means forming a lost motion connection between the propulsion ring and said wheel, a relatively stationary drum element fixed on said chair near said wheel, at least one pivoted over center cooperative braking device attached to the wheel and turning therewith and passing freely across the surface of the drum element during forward propulsion of the chair and automatically assuming an anti-rollback positive locking position with the drum element when the chair tends to roll back on an incline, and connecting means between the means forming a lost motion connection and the pivoted over center braking device and being operable to move the braking device out of engagement with the surface of the drum element during conscious backward propulsion of the wheelchair by its occupant.

4,538,826

AID FOR PROPELLING WHEELED VEHICLES

Romeo Lemarie, Hong Kong, Hong Kong, assignor to Paraid Limited, New South Wales, Australia

Filed Jun. 14, 1984, Ser. No. 620,609
Int. Cl.³ B62M 1/16
U.S. Cl. 280—242 WC **5 Claims**



1. A wheel propelling device to be mounted adjacent a wheel and engage a peripheral surface thereof to enable rotation of same about a wheel axis, said device comprising a base to be mounted so as to be rotatable about said wheel axis, a caliper assembly mounted on said base and including a pair of opposing caliper members selectively movable into frictional engagement with said peripheral surface, an operator manipulable handle pivotally mounted intermediate its ends on said base, said handle being pivotable about a pivot axis to extend generally parallel to but spaced from said wheel axis, and cam means operatively coupling said handle and caliper members so that upon pivoting of said handle about said pivot axis said caliper members engage said peripheral surface to thereby enable an operator to apply a force to said handle to rotate said wheel.

4,538,827

BALL HITCH TRAILER LOCK

John W. Plifka, 5412 - 26th Ave. South, Minneapolis, Minn. 55417

Filed Apr. 16, 1984, Ser. No. 601,071
Int. Cl.³ B60R 25/00; E05B 73/00
U.S. Cl. 280—507 **5 Claims**

1. Anti-theft apparatus for a towable trailer of the type including a ball-type trailer hitch coupler defining a ball-receiving socket and having a yoke hinged for limited rotational motion about a pivot pin upon rotation of a hand-tightening knob, comprising in combination:

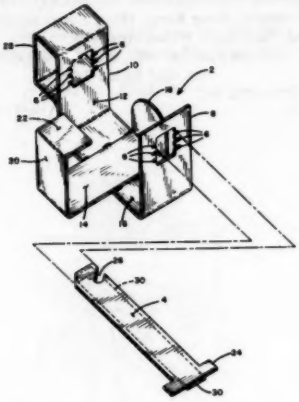
a first U-shaped member having a pair of parallel, spaced apart legs mountable about the tongue of a towed trailer and having at least one pair of aligned apertures formed through said legs;

a dead bolt having a generally rectangular cross-section and a transversely extending head member formed at one end thereof and having a lateral slot extending inwardly from one edge surface of said dead bolt proximate the end of said dead bolt opposite said head member, said slot being of a width to receive the shackle portion of a padlock;

hook means affixed to said U-shaped member and mountable within said ball-receiving socket of said ball-type trailer hitch coupler and including an inwardly turned projection

for mounting about said pivot pin of said trailer hitch coupler; and

housing means affixed to one of said legs of said U-shaped member overlaying the said apertures in said one of said



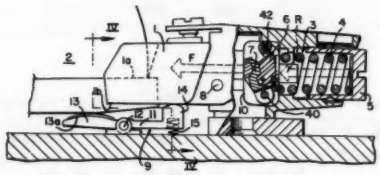
legs such that the slot containing end of said dead bolt is received therein for enclosing the shackle portion of said padlock when fastened about said dead bolt and entered in said slot.

4,538,828

SAFETY SKI BINDING

Jean-Pierre Dimier, Rumilly, France, assignor to Salomon S.A., Annecy, France

Filed Mar. 24, 1983, Ser. No. 478,251
Claims priority, application France, Mar. 25, 1982, 82 05073
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—628 **39 Claims**



1. A safety binding for holding a boot on a ski, comprising:

a jaw adapted to hold at least a portion of said boot, and adapted to laterally pivot;

an elastic system for biasing said jaw against lateral pivoting; and

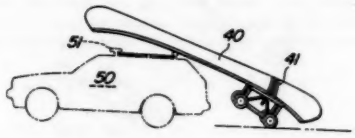
a bias maintenance means for maintaining the total bias on said jaw against lateral pivoting at substantially the same level in the event upwardly directed vertical stress acts on said binding, in the event a downwardly directed vertical stress acts on said binding, and in the event no vertical stress acts on said binding, wherein said bias maintenance means is adapted to reduce said bias caused by said elastic system when upward directed vertical stress acts on said binding, wherein said bias maintenance means is adapted to reduce said bias caused by said elastic system when downward vertical stress acts on said binding, and wherein said binding further comprises a support, wherein said elastic system is adapted to produce a force on said support for biasing said jaw against lateral pivoting, and wherein said bias maintenance means comprises a toggle means for transmitting substantially all of said force from said elastic system to said support when no vertical stress acts on said jaw, and for transmitting less than all of said force from said elastic system to said support when vertical stress acts on said jaw.

4,538,829

CANOE CADDY

Justin Horowitz, R.R. 2, Box 65-C, Iowa City, Iowa 52240

Filed May 16, 1984, Ser. No. 610,907
Int. Cl.³ B60P *3/10*
U.S. Cl. 280—641 **7 Claims**



1. A canoe caddy comprising:

a frame adapted to support one end of a canoe thereon;

front ground-engaging wheel means;

front arm means for pivotally attaching said front ground-engaging wheel means to a front portion of said frame, said front ground-engaging wheel means being rotatably disposed along a first horizontal axis adjacent a bottom portion of said arm means;

rear ground-engaging wheel means;

rear arm means for pivotally attaching said rear ground-engaging wheel means to a rear portion of said frame, said rear ground-engaging wheel means being rotatably disposed along a second horizontal axis parallel to said first horizontal axis;

first positioning means for selectively securing said front and rear arm means in a substantially vertical position for holding said frame directly over said first and second wheel means thereby permitting a canoe while in an inverted position, to be strapped onto said frame and easily loaded onto a carrier rack disposed on top of a vehicle;

second positioning means for selectively securing said front and rear arm means in a folded position wherein said front and rear ground-engaging wheel means are folded upwardly and inwardly towards each other to form a compact unit for travel while said frame is strapped to the canoe in said inverted position and the canoe is mounted on a vehicle top carrier rack; and

third positioning means for selectively holding said frame in a lowered, inclined position wherein said frame is secured substantially over said front wheel means and said rear wheel means is secured outwardly of said frame, whereby one end of the canoe, while in an upright position, can be supported on said frame and the other end of the canoe can be picked up for wheeling the canoe into the water.

4,538,830

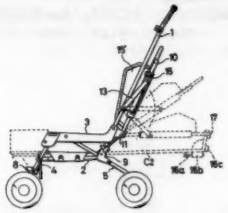
BABY CARRIAGE

Shinroku Nakao, Kanagawa; Hideo Saito, Tokyo; Hitoshi Kato, Tokyo; Yoshiyasu Ishii, Tokyo, and Hiroaki Matsuda, Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1983, Ser. No. 459,030
Claims priority, application Japan, Jan. 19, 1982, 57-6435
Int. Cl.³ B62B *11/00*
U.S. Cl. 280—647 **13 Claims**

1. A baby carriage, comprising; a backrest frame (10), a sheet of fabric (C) laid around said backrest frame, said sheet having a backrest portion (C2) and a head frame (C3) located above said backrest portion, said head frame being bendable with

respect to said backrest portion into an L-shaped form in cross section, and means (16) for setting said head frame (C3) in an upright position with respect to said backrest portion (C2) at



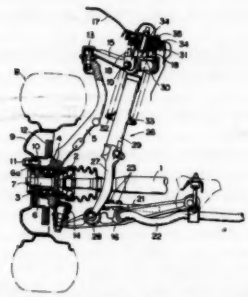
least when said backrest portion is reclined, said setting means (16) being mounted on a rear side of said backrest portion (C2) and said head frame (C3) whereby said setting means permits free angular movement of said backrest portion.

4,538,831

SUSPENSION FOR VEHICLES

Yozo Kami, Saitama; Masaaki Minakawa, and Kenji Kubo, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 553,905
Claims priority, application Japan, Nov. 24, 1982, 57-206658
Int. Cl.³ B60G *3/20*
U.S. Cl. 280—666 **5 Claims**



1. A suspension for a vehicle including a body frame and a steerable driving front road wheel, comprising:

a knuckle arm for supporting said steerable driving road wheel;

an upper arm joined at one end thereof with the upper end of said knuckle arm and pivotably connected at the other end thereof to said body frame;

a lower arm joined at one end thereof with the lower end of said knuckle arm and pivotably connected at the other end thereof to said body frame; and

a shock absorber cooperating with said upper arm and said lower arm for suspending, through said knuckle arm, said steerable driving front road wheel from said body frame;

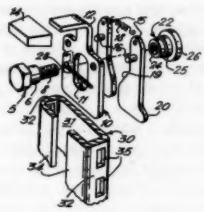
said shock absorber having in the lower part thereof a bifurcate member joined therewith at the upper part thereof, said bifurcate member being extended downwardly, avoiding interference with an axle, and pivotably connected at the lower part thereof to said lower arm, the upper end of said shock absorber being connected to said body frame, said other end of said upper arm being connected to said body frame in a position displaced longitudinally with respect to said vehicle relative to the connection of said shock absorber to said body frame.

4,538,832

ADJUSTABLE SEAT BELT ANCHORAGE

Alexander B. Anderson, Carlisle, England, assignor to ASE (UK) Limited, Carlisle, England

Filed Feb. 14, 1983, Ser. No. 466,066
Int. Cl.³ B60R *21/10*; A62B *35/00*
U.S. Cl. 280—808 **23 Claims**



1. Adjustable anchorage means for a seat belt system, said adjustable anchorage means comprising:

carriage means

support means for a component of said seat belt system and mounted on said carriage means for movement relative thereto from a first position in response to a predetermined load applied to said component,

track means guiding said carriage means for movement of said carriage means along said track means in order to adjust the position of said carriage means relative to said track means,

latch means on said carraige means and engaging said track means in said first position of said support means to oppose said movement of said carriage means, and

means responsive to said movement of said support means relative to said carriage means to enhance said engagement of said latch means with said track means.

4,538,833

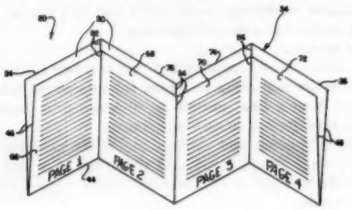
PUBLICATION

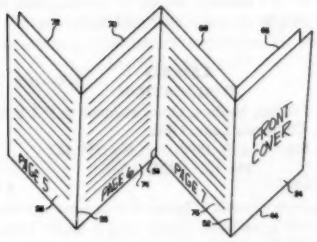
Theodore N. Trikilis, Medina, Ohio, assignor to P I E International Inc., Chippewa Lake, Ohio

Filed Dec. 8, 1983, Ser. No. 559,487
Int. Cl.³ B42D *1/00*
U.S. Cl. 281—2 **4 Claims**

1. A publication capable of being read in a manner similar to a magazine, said publication comprising a single rectangular sheet of material having first and second major side surfaces with a pair of longitudinally extending edges and a pair of transversely extending edges, said sheet including a plurality of panels which are at least partially defined by a plurality of creases which are formed in said sheet and extend between opposite edges of said sheet, said plurality of creases including a longitudinal crease extending between the transverse edges of said sheet and a plurality of transverse creases extending between the longitudinal edges of said sheet, said plurality of creases cooperating to at least partially define a first series of rectangular panels extending along a first longitudinal edge of said sheet and a second series of rectangular panels extending along a second longitudinal edge of said sheet, each panel of said first and second series of panels having a first side formed by a portion of said first major side of said sheet and a second side formed by a portion of said second major side of said sheet, said panels of said first series of panels each having indicia disposed on the first sides of the panels in a first orientation relative to said sheet, said panels of said second series of panels each having indicia disposed on the first sides of the panels in a second orientation relative to said sheet, said first orientation of indicia being offset by 180° from said second orientation of indicia so that when said sheet is laying flat with the indicia on the first series of panels right side up relative to a viewer the indicia on the second series of panels is upside

down relative to the viewer, said sheet being folded along said longitudinal crease to locate the second sides of said first series of panels in juxtaposition with the second sides of said second series of panels with the indicia on the first sides of said first series of panels facing in a first direction and disposed in a right side up orientation when viewed from the first direction and with the indicia on the first sides of said second series of panels facing in a second direction opposite from the first direction and disposed in a right side up orientation when viewed from the second direction, said sheet being folded at the transverse creases in a series of accordion folds with the first sides of said first series of panels in abutting engagement and with the second sides of said second series of panels in abutting engagement when the publication is in a closed condition with the panels disposed in a stack in which the first side of one of the panels in the second series of panels is at the top of the stack of panels to enable indica on the first side of the one panel of the second series of panels to be viewed, said publication being openable to enable it to be read by turning said one panel of the second series of panels about a transverse crease disposed toward the





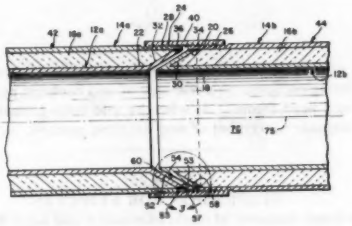
left of the viewer in the same manner as in which the cover of a magazine is turned to open a magazine to thereby expose the first sides of a pair of panels in the first series of panels and then by sequentially turning the panels on the viewers right about center creases between pairs of exposed panels to sequentially expose the first sides of pairs of panels in the first series of panels until the panels are again stacked with a panel which was previously on the bottom of the stack of panels exposed to the viewer and with the first side of said one panel in the second series of panels at the bottom of the stack of panels, said stack of panels being openable from a closed condition in which the first side of said one panel in the second series of panels is at the bottom of the stack of panels by turning the top panel of the stack of panels about a transverse crease disposed toward the left of the viewer in the same manner as in which the cover of a magazine is turned to open a magazine to thereby expose the first sides of a pair of panels in the second series of panels and then turning panels on the viewers right about a center crease until the panels are stacked with the first side of said one panel in the second series of panels at the top of the stack of panels.

4,538,834

TUBULAR ASSEMBLY FOR TRANSFERRING FLUIDS

Joseph H. Brady, Telford; Albert A. Koenig, Coatesville, and Harry Straub, King of Prussia, all of Pa., assignors to General Electric Co., Philadelphia, Pa.

Filed Sep. 9, 1982, Ser. No. 416,410
Int. Cl.³ F16L *17/00*
U.S. Cl. 285—10 **5 Claims**



1. A multiple-section conduit assembly for transporting fluid downwardly in relative thermal isolation with respect to the ambient environment, said conduit assembly comprising, in combination:

at least a pair of adjacent conduit sections arranged in vertical, end-to-end relation, each said conduit section including

an inner pipe adapted to carry said fluid and having first and second ends,

an outer pipe having first and second ends, said outer pipe surrounding said inner pipe in each conduit section in substantially coaxial relationship to define an annular space therebetween and being axially displaced with respect to said inner pipe such that said first and second ends of said inner pipe lead and lag respectively the corresponding ends of said outer pipe,

a frusto-conical structure connecting each pair of corresponding axially displaced pipe ends in each of said conduit sections, a pair of said structures of each coaxial section being adapted to support said coaxial pipes in radially spaced relationship and to provide a fluid tight seal of said annular space, each of said structures including at least one substantially frusto-conical surface adapted to confront a corresponding surface of the adjacent conduit section, said confronting frusto-conical surfaces defining therebetween an interspace of substantially frusto-conical configuration sloping downwardly and outwardly from an open inner end defined between the ends of said inner pipes of the adjacent conduit sections to an outer end defined between the ends of said outer pipes of the adjacent conduit sections, whereby said interspace is in unobstructed, free flowing communication with the fluid-carrying interior of said inner pipes of the adjacent conduit sections and therefore adapted to fill with liquid in the presence of fluid in said inner pipe to provide a thermal barrier trap between the interior of said inner pipes and the ambient environment; and

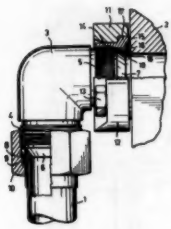
means for joining the adjacent conduit sections and seaing off said outer end of said interspace.

4,538,835

CONNECTION FOR JOINING A PIPE HAVING A FLARED END TO A FIXED CONNECTION PIECE, SUCH AS A PUMP

Göran Sundholm, Metsontie 1 A 12, 04320 Riihikallio, Finland

Filed Jul. 12, 1982, Ser. No. 397,294
Claims priority, application Finland, Dec. 7, 1981, 813920
Int. Cl.³ F16L *25/00*
U.S. Cl. 285—12 **4 Claims**



1. A connection for joining a pipe having a flared end to a fixed connection piece comprising,

a conventional joint piece for flared connections provided at each end with an outer thread and a conical end surface intended to be received by a flared pipe end,

and an insert piece screwed onto the end of the joint piece facing the fixed connection piece for abutment against the end cone of the joint piece and against the end surface of the fixed connection piece, said insert piece being provided with a shoulder for engagement with a clamping flange by tightening of the clamping flange against the fixed connection piece by means of tightening means and a radially inner end portion which extends some distance in front of the end surface of the shoulder towards the fixed connection piece and is joined to the body of the insert piece through an intermediate portion,

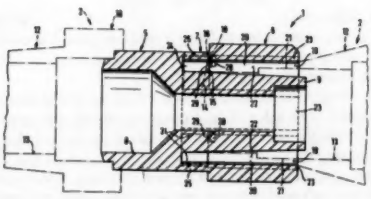
so that when the clamping flange is tightened against the fixed connection, said inner portion of the insert piece will engage the fixed connection piece and be driven to bite into the end cone of the joint piece until the shoulder of the insert piece abuts against the fixed connection piece.

4,538,836

UNION FOR MEDICAL INSTRUMENTS OR PIPES AND A FEMALE HALF OF SUCH A UNION

Viktor Krütten, St. Wendel, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed Apr. 8, 1982, Ser. No. 366,686
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1981, 3114937
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—24 **9 Claims**



1. A union for medical apparatus, comprising:

a male first half with an axially extending spigot of generally round transverse cross-sectional figure;

said spigot having a front end and a base;

said spigot having at least one nosepiece of limited angular extent circumferentially of the spigot;

said nosepiece being provided on a radially outer face of the spigot so as to project radially outwardly therefrom;

a female second half with an axially extending socket which is constructed and arranged to telescopically coaxially receive said spigot;

said second half having a front end and a base;

said second half having at least one locking nosepiece of limted angular extent circumferentially of said socket;

said locking nosepiece being so located on said second half as to be initially disposed in obstructing relation to completion of telescopic reception of said spigot in said socket;

at least one of said spigot nosepiece and said locking nosepiece being so constructed, arranged and mounted on said second part as to be sufficiently elastically deformably temporarily moved by attempted further insertion of said spigot into said socket after being engaged by said first half, as to permit completion of telescopic reception of said spigot in said socket;

said locking nosepiece having provided on a back side thereof at least one stop face and said spigot nosepiece having provided on a back side thereof at least one stop face, these two stop faces being positioned to engage once telescopic reception of said spigot in said socket has been completed, in such a sense as to cause attempted axial withdrawl of said spigot from said socket while said two stop faces are engaged, to be subject to greater resistance than is said completion of telescopic reception during said further insertion;

said spigot nosepiece being located in the vicinity of the front end of said spigot and extending less than 180° in the circumferential direction of the spigot;

said second half, between said front end thereof and said locking nosepiece, having a guide structure which at least partially encloses said socket;

said guide structure including means providing at least one axially extending, axially frontwardly and radially inwardly opening guide groove for receiving a respective said spigot nosepiece as said spigot is being telescopically received in said socket;

said guide groove having a front and a back located axially opposite one another;

said locking nosepiece being located axially towards the back of said guide groove;

said first half having means defining a duct extending longitudinally therethrough within said spigot;

said second half having an axially extending pin disposed coaxially within said socket;

said pin having a radially outer face which is radially spaced from said guide structure;

said socket being defined at least in part as an annular space of ring-shaped transverse cross-sectional figure radially between said radially outer face of said pin, and said guide structure;

said pin having means defining a duct extending longitudinally therethrough, this duct being constructed and arranged for communication with said duct of said first half upon completion of telescopic reception of said spigot in said socket;

said radially outer face of said pin being conically tapered toward said front end of said second half;

said duct of said spigot being conically flared toward said front end of said spigot, complementarily with said conical tapering of said pin at a cone angle of 1:16.67 for compatability with Luer union parts;

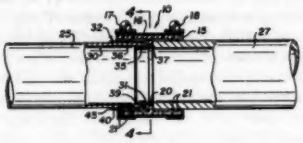
said stop face on said spigot nosepiece being located in an imaginary plane extending at a helix angle of 12° for comparability with a standard Luer union screw nut.

4,538,837

ANTI-CORROSION PIPE APPARATUS

Allan D. Cronk, 950 Greenwood Rd., West Vancouver, British Columbia, Canada

Filed Sep. 29, 1982, Ser. No. 428,479
Int. Cl.[3] F16L *21/00*
U.S. Cl. 285—55 5 Claims



1. A pipe assembly, comprising:

(a) first and second coaxial interconnected pipe portions having inner and outer peripheral surfaces and said second pipe portion having an end portion with a wall thickness exceeding the wall thickness of the corresponding end portion of said first pipe portion;

(b) a non-corrosible lining coating said inner peripheral surface of at least said first pipe portion;

(c) an annular sleeve fitted over and gripped to a first end portion of said first pipe portion, said sleeve comprised of a non-corrosible resilient material;

(d) said sleeve comprising concentric radially spaced inner and outer bands joined at adjacent edges thereof by an annular web and thereby forming an annular pocket having an entrance opening away from said web and adapted for receiving said first end portion so that the end thereof seats on said web;

(e) said inner band contiguously disposed for the length thereof in engagement with the radially inner surface of said lining and with said outer band contiguously disposed for the length thereof in engagement with said outer peripheral surface so that fluid flowing through said first pipe portion is prevented from engaging said first end portion;

(f) said outer band extends longitudinally from said web a distance exceeding the distance said inner band extends and said outer band having sufficient thickness so that the outer surface thereof is of an outer diameter substantially equal to the diameter of said outer peripheral surface of said second pipe portion;

(g) an axially extending recess of substantial length disposed in the outer surface of said outer band proximate the end thereof opposite said web;

(h) a gasket sealingly engaged with the outer surface of said outer band and with said outer peripheral surface of said second pipe portion, said gasket having a radially inwardly extending flange engaged with said web and with the corresponding end portion of said second pipe portion for preventing fluid leakage from between said pipe portions when interconnected;

(i) a shield exteriorly surrounding said gasket; and,

(j) first and second clamp means circumferentially disposed about said sleeve and sufficiently tightened to cause said gasket to grip and thereby engage the outer surface of said outer band and said second pipe portion outer peripheral surface;

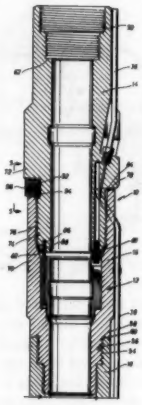
(k) said first clamp means aligned with said recess and sufficiently tightened to cause the underlying gasket and shield to press into said recesses and thereby prevent said pipe portions from becoming uncoupled.

4,538,838

METHOD AND APPARATUS OF SEALING THREADED SECTIONS OF A WELL TOOL

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 440,667, Nov. 10, 1982, Pat. No. 4,460,046. This application Dec. 20, 1982, Ser. No. 450,943
Int. Cl.[3] F16L *37/00*
U.S. Cl. 285—91 10 Claims



1. A pressure sealed joint between a male and female threaded connection of a well tool comprising,

said female connection including an end on one side of its thread and a shoulder on the other side of its thread,

the male connection including an end on one side of its thread and a shoulder on the other side of its thread,

a soft metal seal positioned between the end of the male connection and the shoulder on the female connection for sealing between the connections when the connections are threaded together,

a non-circumferentially extending hole drilled in the exterior of the made-up connection through the shoulder of the male connection and the end of the female connection, and

a plug positioned in the hole with a force fit for maintaining the rotational and longitudinal alignment of the made-up connection.

4,538,839

PIPE JOINT COUPLING

Harry J. Ledgerwood, Marshfield, Mo., assignor to Plessey Incorporated, Los Angeles, Calif.

Continuation-in-part of Ser. No. 574,585, Jan. 27, 1984, abandoned. This application Jul. 6, 1984, Ser. No. 628,657
Int. Cl.[3] F16L *21/06*
U.S. Cl. 285—236 4 Claims

1. A pipe coupling for holding a resilient gasket around the ends of two pipes, said coupling comprising:

a thin-walled coupling shield,

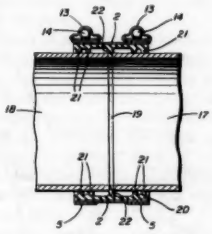
first corrugations defined by said coupling shield extending through both sides of said coupling shield and extending substantially parallel to the longitudinal axis of the coupling shield,

second corrugations defined by said coupling shield extending through both sides of said coupling shield and extending transverse to the longitudinal axis of the coupling shield, said first corrugations and said second corrugations extending across a substantial portion of the width and length of said coupling shield,

a plurality of rectangles formed by the intersections of said first corrugations and said second corrugations,

a projection formed within each of said plurality of rectangles for biting into said resilient gasket during tightening of said coupling shield around said gasket to prevent extrusion of said gasket from the sides of said coupling shield,

a plurality of sets of four depressed corners, one set of four



depressed corners being located at the corners of each of said plurality of rectangles formed by the intersection of two adjacent first corrugations and two adjacent second corrugations, each set of four depressed corners surrounding one of said projections, and

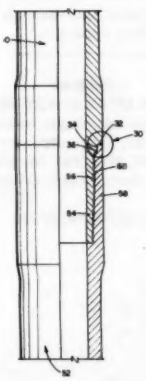
means for tightening said coupling shield around said resilient gasket to locate the ends of two pipes adjacent one another and to seal a gap formed between the two pipe ends during fluid flow.

4,538,840

CONNECTOR MEANS FOR USE ON OIL AND GAS WELL TUBING OR THE LIKE

Richard W. DeLange, 13011 Northborough, Apt. 312, Houston, Tex. 77067

Filed Jan. 3, 1983, Ser. No. 454,964
Int. Cl.³ F16L *25/00*
U.S. Cl. 285—333 **14 Claims**



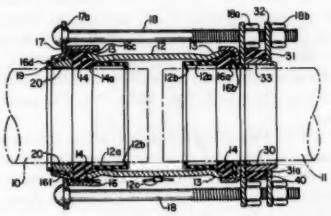
1. Connector means for joining together two adjacent pipe members comprising a male member having an externally threaded portion associated therewith and an unthreaded annular portion positioned axially adjacent said threaded portion, a female member having an internally threaded portion associated therewith adaptable for cooperatively engaging the threaded portion of said male member, said female member including a corresponding unthreaded annular portion positioned axially adjacent said female threaded portion, each of said unthreaded portions including a group of three complementary annular sealing surfaces having a first surface angularly positioned relative to the longitudinal axis of said pipe members such that said first surface is angularly displaced therefrom in the range from between approximately 90° to 125°, a second surface located adjacent to said first surface, said second surface being angularly positioned relative to the longitudinal axis of said pipe members such that said second surface lies in a plane substantially parallel to the longitudinal axis of said pipe members, and a third surface located adjacent to said second surface, said third surface being angularly positioned relative to the longitudinal axis of said pipe members such that the angular displacement of said third surface relative to said longitudinal axis is greater than the angular displacement of said second surface relative to said longitudinal axis, the second surface associated with each of said group of three sealing surfaces being disposed between said first and third surfaces, and unthreaded portions being positioned respectively on said male and female members such that when said male and female members are threadingly secured together the sealing surfaces associated respectively therewith sealingly engage one another to form three independent adjacent pressure-tight seals.

4,538,841

INSULATED PIPE COUPLINGS

James M. Royston, Pittsburgh, Pa., assignor to Coupling Systems, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 531,034, Sep. 12, 1983,. This application Jun. 14, 1984, Ser. No. 620,429
Int. Cl.³ F16L *17/00*
U.S. Cl. 285—337 **14 Claims**



1. A coupling for joining two spaced coaxial pipe ends anchored against longitudinal movement comprising an elongate sleeve adapted to receive coaxially two opposing pipe ends to be connected, said sleeve having frusto-conical enlarged ends opening outwardly, a pair of cylindrical elastomeric gaskets having frusto-conical end portions adapted to fit in the frusto-conical ends of said sleeve in sliding engagement around the pipe ends to be connected, a follower member bearing on each of said gaskets to force them into the sleeve ends, tightening means acting on the follower member to move at least one of the follower members toward the other axially whereby the gaskets are forced into the frusto-conical ends of the sleeve in sealing engagement with said ends and the pipe ends to be connected, an insulating generally cylindrical sleeve means surrounding at least one of said pipe ends between said pipe end and said elongated sleeve, said insulating sleeve having radially inwardly extending spacer means spacing said insulating sleeve from the pipe, at least one of said follower members having a frusto-conical opening surrounding the pipe ends being connected, said opening in said at least one follower member having its large end opening toward the large end of the frusto-conical end of said sleeve, a frusto-conical split jaw member permitting expansion and contraction thereof around one of said pipe ends to be connected with the frusto-conical opening in said at least one follower, surface engaging means on the jaw member adapted to engage the outer surface of said one pipe end and an insulating member provided in said fol-

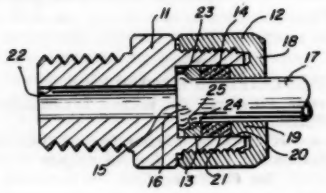
lower member having a frusto-conical opening, said insulating member having the shape of the follower member and with an annular frusto-conical flange corresponding to the frusto-conical opening of said follower member and adapted to extend through said opening between the follower member and jaw member.

4,538,842

HIGH PRESSURE, LEAKPROOF, BLOWOUT-PROOF TUBE FITTING

Leonard J. Kowal, Prospect Heights, and Albert J. Schwarz, Lincolnwood, both of Ill., assignors to Imperial Clevite Inc., Glenview, Ill.

Filed Sep. 8, 1983, Ser. No. 530,793
Int. Cl.³ F16L *19/00*
U.S. Cl. 285—354 **4 Claims**



1. In a tube connection having a fitting member defining an outwardly opening right-circularly cylindrical recess for receiving the end of a tube to be connected, the tube end comprising a radially outwardly enlarged distal portion, and a retaining member adjustably secured to the fitting member for use in retaining the tube end in said recess, the improvement comprising:

tubular seal means having a right-circularly cylindrical radially outer surface and a right-circularly cylindrical radially inner surface arranged to be disposed annularly about the tube axially outwardly of the enlarged distal portion thereof and fully within said recess;

a rigid annular support ring arranged to be disposed about the tube axially inwardly of the seal means to be retained against axial displacement inwardly from the tube by the enlarged distal portion thereof and having a close axially movable fit with the wall of the fitting member defining said recess and arranged to have close axially movable fit with the radial outer surface of the tube end for preventing extrusion of the seal means axially inwardly past said support ring, said support ring having an axially inner end preselected to abut the enlarged distal portion of the tube end with a complementary facial engagement therewith; and

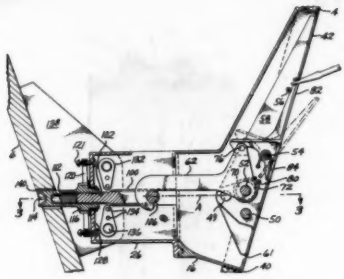
means formed integrally with said retaining member defining a tubular wall adapted to be slidably fitted between the radially outer surface of the tube end and the wall of the fitting member defining said recess for effectively compressively retaining the seal means in said recess as an incident of adjusted securing of the retaining member to the fitting member in a made-up arrangement of the fitting, said tubular seal means defining opposite planar ends and said support ring and tubular wall defining planar surfaces abutting said planar ends of the seal means whereby the seal means effectively fully fills the annular space about the tube between said support ring and the axially inner end of said wall of the retaining member to seal the tube end to the fitting member.

4,538,843

PRELOADED LATCH

Alfred W. Harris, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 4, 1983, Ser. No. 472,065
Int. Cl.³ E05C *5/02, 19/14*
U.S. Cl. 292—113 **20 Claims**



1. For use in an aircraft component having spaced-apart walls that include opposed movable panels, latching apparatus for securing the panels in flush positions, comprising:

first and second housings, each said housing having a generally inwardly extending strut portion with an inwardly facing mating surface and mounting means for mounting the housing on one of the panels;

latch hook means mounted on the first housing;

catch means mounted on the second housing for engaging the latch hook means to secure each of the panels in its flush position; and

means for tensioning the engagement of the latch hook means and the catch means to preload the latching apparatus;

wherein the latch hook means and catch means are positioned to provide a latch load path that is generally perpendicular to the panels; and

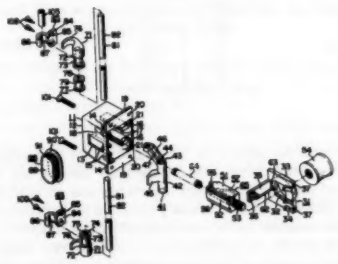
wherein when the latching apparatus is in a latching position, said mating surfaces are urged together and said inwardly extending strut portions form a strut to react the preload on the latching apparatus.

4,538,844

LOCKING DEVICE FOR DOOR

Minoru Watanabe, Kokubunji, Japan, assignor to Kabushiki Kaisha Murakoshi Seiko, Tokyo, Japan

Filed Jan. 30, 1984, Ser. No. 574,735
Claims priority, application Japan, Jul. 14, 1983, 58-109559[U]
Int. Cl.³ E05C *9/08*
U.S. Cl. 292—127 **4 Claims**



1. A locking device for a door which has front and rear

surfaces, a hinged edge and free edges and which is hinged to a frame at its hinged edge to swing forward to an open position and rearward to a closed position, said locking device comprising:

A. a housing for securement to the rear surface of the door near one of its free edges, said housing
  (1) having top, bottom, rear and side walls,
  (2) having an open front that can align with a hole through the door, and
  (3) having a latch hook aperture in its side wall nearest said free edge of the door;
B. a latch hook body in said housing having
  (1) a shaft portion which has its axis substantially parallel to the side and rear walls of the housing and which is confined to rotation about its axis relative to the housing,
  (2) a latch hook projecting laterally from said shaft portion to be swung by rotation of the shaft portion between a retracted position, disposed substantially wholly within the housing, and a latching position protruding from said housing through said aperture for engagement with a keeper on said frame, and
  (3) a crank arm secured to said shaft portion and projecting laterally therefrom in axially spaced relation to said latch hook, said crank arm having a crank slot therein;
C. a sliding body confined by said housing to forward and rearward sliding motion therein and biased forwardly, said sliding body
  (1) having a pin fixed thereto which is slidingly engaged in said crank slot and which cooperates with the crank arm to translate forward and rearward motion of the sliding body into rotation of said shaft portion that swings the latch hook respectively to its locking position and to its releasing position, and
  (2) having a substantially heart-shaped cam groove therein;
D. means on the front of said sliding body, projecting through said hole through the door, for manually actuating the sliding body rearward against its bias; and
E. an operating rod substantially confined against forward and rearward motion relative to the housing and having a portion engaged in said cam groove to so cooperate therewith that successive rearward actuations of the sliding body alternately establish it in a rearward position in which it maintains said latch hook in its retracted position and in a forward position in which it maintains the latch hook in its latching position.

4,538,845

AUTOMOBILE LOCKING APPARATUS

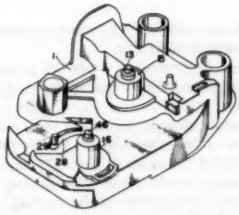
Shinjiro Yamada, Tokyo, Japan, assignor to Mitsui Kinzoku Kogyo K. K., Tokyo, Japan

Filed May 26, 1983, Ser. No. 498,395

Claims priority, application Japan, May 31, 1982, 57-92696; Sep. 16, 1982, 57-161411

Int. Cl.³ E05C *3/26*

U.S. Cl. 292—216 **4 Claims**



1. Automobile locking apparatus comprising
a one-piece, molded body made from synthetic resins, and having a recess in its front side, and a pair of spaced sleeves integral with and projecting from its back side coaxially of a pair of spaced, parallel axes,
a pair of shafts secured in said sleeves coaxially thereof and projecting into said recess;
a cooperating latch and ratchet mounted in said recess each to pivot intermediate its ends about a different one of said shafts and into and out of operating positions in which said ratchet releasably secures said latch in latching engagement with the striker of an automobile door,
a release lever pivotally mounted intermediate its ends on one of said sleeves and operatively connected to said ratchet selectively to impart pivotal movement thereto to effect release of said latch, and
a locking lever pivoted on the other of said sleeves for movement into and out of a locking position in which it prevents said release lever from imparting said pivotal movement to said ratchet.

4,538,846

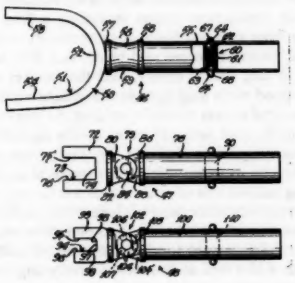
CARPET STRETCHER ASSEMBLY

Jerry M. Alexander, 140 Illinois Blvd., Hoffman Estates, Ill. 60195

Filed Mar. 24, 1980, Ser. No. 132,802

Int. Cl.³ A47G *47/04*

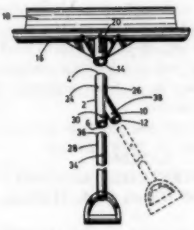
U.S. Cl. 294—8.6 **6 Claims**



1. A plurality of attachments for a carpet stretcher of the type having a carpet engaging head and a plurality of extensible tube sections connected to the head with the end tube section opposite the head being adapted to releasably receive a reaction foot having a flat surface adapted to react against a wall or the like, comprising; a first brace assembly for providing the entire reaction support for the head having a rod portion adapted to be releasably received within the end section of the carpet stretcher, a generally U-shaped retainer portion non-pivotally connected to said rod portion, said U-shaped retainer portion being constructed to fit around and pivot with respect to a vertical fixed support to provide the desired reaction force for the carpet stretcher head, said rod portion having locating means cooperating with the end section to angularly locate the U-shaped retainer portion in a horizontal plane, a second brace assembly for providing the entire reaction support for the head having a rod portion adapted to be releasably received within the end section of the carpet stretcher, a second generally U-shaped retainer portion pivotally connected to the second rod portion and being constructed to fit around and non-rotatably grip a non-circular fixed support, said second U-shaped retainer portion being smaller than the first U-shaped retainer portion to accommodate differently sized and shaped fixed supports, said second brace assembly rod portion having locating means cooperating with the end section to angularly locate the second U-shaped retainer portion in a horizontal plane, and means for limiting pivotal movement of the second U-shaped retainer portion with respect to the

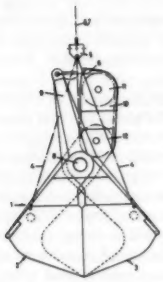
second brace assembly rod portion to less than about 30 degrees to provide reaction force to the stretcher head.

4,538,847
PIVOTABLE MULTIPLE SOCKET
John F. Lapshansky, 401 Terry Dr., Joliet, Ill. 60435
Filed Jul. 10, 1984, Ser. No. 629,375
Int. Cl.³ A01B *1/22*; B25G *3/12*; E01H *5/02*
U.S. Cl. 294—51 **10 Claims**



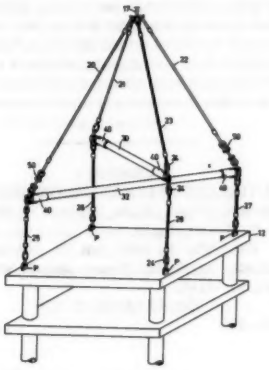
1. A pivotable multiple socket for a shovel, comprising first socket means to receive the insertable end of a shovel handle, connection means to connect said first socket means to a shovel blade, said connection means including a longitudinal axis extending from a shovel blade at substantially a right angle to the lateral direction across said blade, said first socket means including a first socket cavity, said first socket cavity being axially aligned with said connection means when connected thereto, second socket means to receive the insertable end of a shovel handle, said second socket means including a second socket cavity being positioned on said pivotable multiple socket whereby its longitudinal axis extends at an oblique angle to the longitudinal axis of said first socket cavity, and rotation means operatively associated with said first socket means and said connection means whereby said pivotable multiple socket may be rotated on said longitudinal axes of said connection means and of said first socket means axially aligned therewith.

4,538,848
GRAB
Peter Aberkrom, Nieuwerkerk a/d IJssel, Netherlands, assignor to Nemag B.V., Deltastraat, Netherlands
Filed Nov. 14, 1983, Ser. No. 551,721
Claims priority, application Netherlands, Nov. 12, 1982, 8204386
Int. Cl.³ B66C *3/12*
U.S. Cl. 294—68.23 **11 Claims**



1. A grab comprising:
a pivot shaft;
first and second buckets pivotally connected to the pivot shaft;
a yoke;
at least one suspension rope connecting the first and second buckets to the yoke;
first and second closing ropes connected to the second bucket to move the buckets between open and closed positions; and
guide and close pulleys connected to the first bucket and engaging the closing ropes to guide movement thereof;
each bucket including a bottom; first and second side plates pivotally connected to the pivot shaft; and a pair of planar carrier arms, each arm secured to the bottom of the bucket, pivoted at the pivot shaft, and including an outward position extending outward from the pivot shaft;
wherein when the grab is in the open position, the carrier arms of the second bucket are outside the carrier arms of the first bucket;
the second bucket further including
a first stiffening plate connected to an outward portion of a first carrier arm of the second bucket, extending therefrom, laterally outward from the carrier arms of the second bucket, and further connected to the pivot shaft, and
a second stiffening plate connected to an outward portion of a second arm of the second bucket, extending therefrom, laterally outward from the carrier arms of the second bucket, and further connected to the pivot shaft.

4,538,849
SPREADER BAR ASSEMBLY
Jon E. Khachaturian, and Joseph P. Charles, both of Harvey, La., assignors to Versabar, Inc., Harvey, La.
Continuation-in-part of Ser. No. 300,059, Sep. 8, 1981, Pat. No. 4,397,493. This application Aug. 8, 1983, Ser. No. 521,365
Int. Cl.³ B66C *1/12*
U.S. Cl. 294—81.1 **8 Claims**



1. A composite spreader bar lift system comprising:
a. a primary common load line;
b. a bridle assembly depending from the primary load line and comprising four radially spaced, downwardly branching bridle lines;
c. a pair of separate elongated support bars, each supported independently of the other support bar by the bridle lines in alternate radial positions so that: (1) each support bar can move independently of the other during a lift responsive to a change in position of the package being lifted, and (2) the ends of the support bars can be maintained in corresponding radially spaced apart positions with respect to the load line;
d. four secondary load lines, each attached at its upper end respectively to an end of one of the support bars so that

each secondary load line can hang in a vertical position when all of the secondary load lines are spaced apart such as during a lift; and

e. each secondary line at the lower end thereof being connectable to a weighted package that is to be lifted.

4,538,850

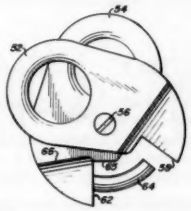
HOISTING AND SHACKLE SYSTEM

Nicholas A. De Vito, 117 Allwood Rd., Clifton, N.J. 07014

Filed Mar. 7, 1983, Ser. No. 473,102

Int. Cl.³ B66C *1/34, 1/66*

U.S. Cl. 294—89 **5 Claims**



1. A scissors-like engagement means, comprising: pivotally secured first and second mating elements mutually comprising, at the ends thereof, surfaces for complementally gripping and holding a projecting segment of an anchor means, and in which the external surfaces of the ends of said mating elements define a parabolic surface that nests within a semi-hemispherical recess surrounding said anchor means, said complemental gripping surfaces comprising male and female elements depending from and centrally disposed within the gripping surfaces, said gripping surfaces being normally parallel to each other when the engagement means is in a closed position about the anchor means, said male element comprising an elongate, curvilinear, solid cylindrical member, the line of curvature of which lies substantially equidistant from the surface of said semi-hemispherical recess within which said parabolic surface of said mating elements nests, whereby a positive interlock between said curvilinear male element and its complementary female element is thereby obtained, this, in combination with said anchor means gripping surfaces, precluding movement of said anchor means, relative to the engagement means, both within the linear axis of said male and female elements and in any plane transverse thereto.

4,538,851

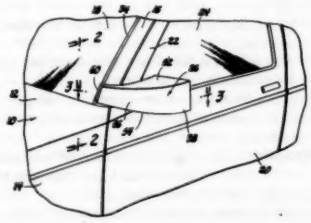
AERODYNAMIC REAR VIEW MIRROR

Edward F. Taylor, Farmington Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 18, 1984, Ser. No. 571,790

Int. Cl.³ B62D *35/00*

U.S. Cl. 296—1 S **7 Claims**



1. In combination with a vehicle body having a windshield pillar defining the intersection between the windshield and the door side window of a vehicle body, a rear view mirror mounted on the vehicle body for rear viewing through the side window comprising:

a mirror glass;

a housing mounting the mirror glass and having an inboard side wall extending generally vertically and curved to define a rear portion generally parallel with the side window and a forward portion reaching inboard around the pillar, said inboard side wall being situated in spaced relationship relative the side window and the pillar to cooperate therewith in defining an airflow channel therebetween by which relatively clean air from the region in front of the windshield is ducted through the airflow channel around the pillar to the region of the side window to thereby create an airflow barrier against contamination of the side window and to streamline airflow around the vehicle body.

4,538,852

DRAFT DEFLECTORS FOR MOTOR CARS

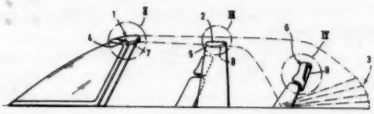
Claude Lobo, Cologne, and Peter Burger, Pulheim-Geyen, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 2, 1983, Ser. No. 529,173

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235148

Int. Cl.³ B60J *7/22;* **B62D** *35/00*

U.S. Cl. 296—91 **4 Claims**



3. Draft deflector means for motor cars of the type having a folding roof, a padded front roof cross member, a padded, longitudinally intermediate roll bar, and rear seat headrests, the draft deflector means characterized in that a first draft deflector is formed as part of the front roof cross member padding, a second draft deflector is formed as part of the roll bar padding, and that each of the draft deflectors are mounted for pivotal movement about axes transverse to the motor car.

4,538,853

CHAIR FOR HANDICAPPED PERSONS

Nat Levenberg, 1345 Halsey St., Brooklyn, N.Y. 11227

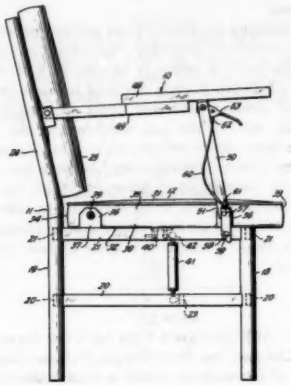
Filed Dec. 22, 1983, Ser. No. 564,555

Int. Cl.³ A47C *1/02*

U.S. Cl. 297—339 **2 Claims**

1. A chair construction for use by handicapped persons comprising: a relatively rigid frame element and a moveable seat element; said frame element including a plurality of frame members providing a fixed horizontal platform at normal seat height, and generally vertically oriented support means at one side of said horizontal platform; a fixed back cushion supported by said last-mentioned support means; a seat bottom cushion mounted on said platform for pivotal movement on an axis parallel to and adjacent a rear transvers edge thereof; a plurality of resiliently compressible members interconnecting said frame element and an undersurface of said bottom cushion forwardly of said axis; a pair of arm rests each including a pivotally interconnected horizontal and vertical strut; said horizontal strut being pivotally connected at the rear end thereof to said frame element at a point adjacent said fixed back cushion, said vertical strut being connected at a lower end to said seat cushion forwardly of said resiliently compressible members; whereby upward movement of said seat cushion results in corresponding movement of said arm rests; and a

locking means manually controllable from said arm rests for fixing the position of said seat cushion in substantially horizontal position against the compressive force of said resiliently compressible elements.



4,538,854

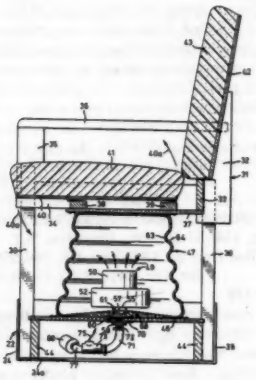
ELEVATOR CHAIR

Ross E. Wilson, Guelph, Canada, assignor to Morette's Limited, Hillsburgh, Canada

Filed Dec. 13, 1982, Ser. No. 449,177

Int. Cl.³ A47C *1/02*

U.S. Cl. 297—345 **9 Claims**



1. A chair comprising:

a seat portion mounted to be movable between a lower position and a higher position,

upright guide means for guiding the movement of the seat portion,

an inflatable bag under the seat portion adapted, during inflation, to raise the seat portion toward said higher position,

and a vacuum-producing motorized device within and enclosed by the bag for drawing air into the bag along a conduit which passes to the exterior of the bag, thereby to inflate the bag and raise the seat portion, whereby noise from the motorized device is muted by the presence of the surrounding bag, and whereby to efficiently use the space under the seat portion for both the bag and the motorized device.

4,538,855

ADJUSTING ARRANGEMENT FOR SEAT, PARTICULARLY POWER VEHICLE SEAT

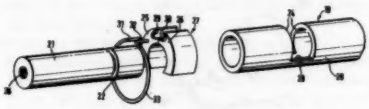
Walter Peetz, Hackenheim; Hans Wilking, Rothselberg, and Egon Kafitz, Hochspeyer, all of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Remscheid, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 504,842

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222758

Int. Cl.³ A47C *1/025*; F16H *55/18*

U.S. Cl. 297—362 **8 Claims**



1. An adjusting arrangement for inclination adjustment of a backrest of a seat, particularly a power vehicle seat, comprising

two hinges arranged to adjustably connect a backrest with a seat part of the seat at each side of the latter, each of said hinges having a first hinge lever associated with the backrest and a second hinge lever associated with the seat part and connected with one another by a pivot axle; and

displacing and fixing means arranged to determine a position of said hinge levers relative to one another and formed as a wobble drive, said means having an eccentric associated with said pivot axle and retained in a force-transmitting abutment on said pivot axle, said eccentric being composed of two wedge-shaped cylindrical segments, and a spring element supporting said wedge-shaped cylindrical segments on said pivot axle in a force-transmitting abutment, for spreading apart said wedge-shaped cylindrical segments, said pivot axle being formed by a single one-piece continuous shaft which connects said hinges with one another and has end portions which directly pivotally support one of said hinge levers of each pair of said hinge levers, said shaft having a recess provided in each of said end portions and receiving said wedge-shaped cylindrical segments, and the other of said hinge levers of each pair of said hinge levers surrounding said wedge-shaped cylindrical segments received in said recess.

4,538,856

RECLINING ANGLE ADJUSTMENT DEVICE

Naoaki Katsumoto; Hideyuki Ohshiro, and Masanori Sakai, all of Fujisawa, Japan, assignors to Shiroki Kinzoku Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 20, 1982, Ser. No. 420,604

Int. Cl.³ B60N *1/06*

U.S. Cl. 297—367 **6 Claims**

1. A reclining angle adjustment device for a reclining seat, comprising:

a seat back arm which is fixed to a seat back portion being rotatably mounted on a first axis,

a base arm which includes an arc type internal gear therein and is fixed to a seat portion being rotatably mounted on said first axis,

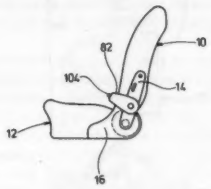
a first control lever for rough adjustment of reclining angle rotatably mounted on said seat back arm rotating a stopper clockwise and counterclockwise,

a regulating plate being engaged with said stopper,

a second control lever for minute adjustment of reclining angle rotatably mounted on said first axis coaxially with the first pinion,

a relatively enlarged gear which is fixed on a second axis and is engaged with a first pinion being rotated by said second control lever,

a second pinion which is fixed on said second axis coaxially with said relatively enlarged gear being engaged with said arc type internal gear, and



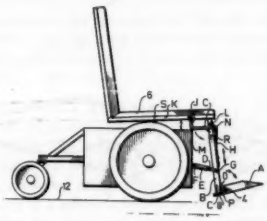
a brake member which obstructs rotation of said first pinion by means of friction force generated with said base arm wherein said second control lever includes a feeding gear and a feeding pawl which is engaged with said feeding gear to roll said second pinion through said relatively enlarged gear.

4,538,857

FOOT REST ARRANGEMENT FOR WHEELCHAIRS

Bo H. S. Engman, Sunds Bruk, Sweden, assignor to Permobil AB, Timra, Sweden

Filed May 3, 1983, Ser. No. 491,015
Claims priority, application Sweden, May 4, 1982, 8202780
Int. Cl.³ A47C *7/50*
U.S. Cl. 297—437 **7 Claims**



1. A foot rest arrangement for wheelchairs comprising:

(A) a frame system including

(i) a wheelchair frame, and

(ii) a chair seat frame supported by said wheelchair frame and mounting a chair seat;

(B) a foot rest formed with an upstanding back edge and a glide roller at the back edge of the lower portion of said foot rest;

(C) a strut structure comprising an outer strut and an inner strut operatively interconnected and mutually displaceable in an axial direction, the upper portion of said upstanding back edge of said foot rest being pivotably attached to the lower end portion of said outer strut and the upper end portion of said inner strut being secured to said frame system so that said strut structure carries said foot rest at a distance from said chair seat;

(D) releasable latching means operatively engageable with said inner and outer struts and adapted to lock said inner and outer struts in a latched position relative to each other with said foot rest at an appropriate distance from said chair seat; and

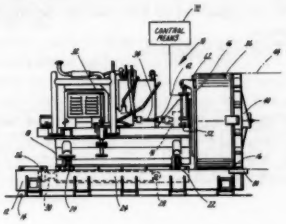
(E) means operatively connected to said latching means for permitting varying the distance between said foot rest and said chair seat by raising or lowering one relative to the other; the lengths of said struts being selected such that in the latched position of said struts the lower end portion of said inner strut defines a bevelled edge projecting out from said lower end portion of said outer strut to bear against said glide roller, thereby by abutment of said bevelled edge and said glide roller to lock said foot rest in a given angular position relative to said strut structure when the struts are in the latched position.

4,538,858

APPARATUS FOR DRILLING AND INSERTING A HORIZONTAL PIPE

Jonathan R. Kilgour, 40570 Harris Rd., Belleville, Mich. 48111

Filed Aug. 13, 1984, Ser. No. 639,743
Int. Cl.³ E21B *3/00*
U.S. Cl. 299—55 **4 Claims**



1. Apparatus for boring a generally horizontal hole in soil and inserting a pipe into the hole, comprising:

an elongated base, and track means mounted on the base;

a carriage mounted on the track means so as to be movable therealong from a first position toward a second position along a path of motion parallel to the track means;

first power means connected between the base and the carriage for moving the carriage from said first position towards said second position;

rotary drive means mounted on the carriage;

auger means, including a cutting edge, connected to the rotary power means for boring a hole in soil as the carriage is being moved from said first position towards said second position;

pipe pushing means including a push ring of a first diameter, mounted on the carriage so as to be movable therewith in a pipe pushing motion to push a section of pipe into the hole bored by the auger means, the pipe pushing means being movable with respect to the carriage in a direction generally normal to the path of motion of the carriage on the track means; and

second power means connected to the pipe pushing means for either raising or lowering the push ring and the auger means an adjusted distance with respect to the track means from a first pipe pushing position to a second pipe pushing position,

whereby, the same diameter push ring may be moved in a pipe pushing motion with the carriage at such time as the push ring is disposed in either said first pipe pushing position or said second pipe pushing position.

4,538,859

AUXILIARY MECHANICAL AND PHYSICALLY CONTROLLED ELECTRONIC ACTUATED AIR PRESSURE HANDLING APPARATUS FOR TRUCK AND TRAILER BRAKING SYSTEMS

Carl D. Russell, #30 Ramm's Ct., Hwy. 59, Sallisaw, Okla. 74955

Filed Nov. 7, 1983, Ser. No. 402,095
Int. Cl.³ B60T *8/00, 15/58*
U.S. Cl. 303—24 R **2 Claims**

1. Apparatus for selectively converting a vehicle conventional air braking system to an intermittent air braking system

wherein electrically responsive brake actuator means apply brakes, in response to depression of the brake pedal, intermittently unless an intermittent action is cancelled and conventional braking is used, comprising in combination:

an electrical circuit for generating intermittent electrical output power connected to energize said actuator means;

an energizing electrical connection including a mechanically actuable switch for said circuit;

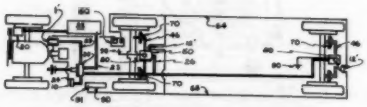
a switch actuator pendulum;

a safety rod movable from a home position by actuation of the brake pedal;

means biasing the pendulum against an end of said rod;

means connecting the pendulum to actuate said switch to a closed position when the pendulum swings forward relative to the vehicle as the vehicle is slowing thereby establishing energization of said circuit for intermittent brake operation;

a level detecting pendulum;



a slide carried by the safety rod;

means biasing the level detecting pendulum against the slide in a substantially vertical position;

means biasing the slide against the level detecting pendulum;

said switch carried by said level detecting pendulum whereby the level detection pendulum is pressed forward of its vertical position further when the vehicle is braking on a down slope than on an up slope;

a third pendulum adjacent to the switch actuator pendulum and carrying a contact normally making electrical connection with a contact carried by the switch actuator pendulum with the contact of the switch actuator pendulum and the contact of the third pendulum being in the energizing electrical connection for said circuit; and,

said safety rod disabling the intermittent action upon extreme depression of the brake pedal by pushing against said third pendulum to separate the third pendulum contact from the switch actuating pendulum contact.

4,538,860

WEAR RESISTANT WHEEL FOR TRACK LAYING VEHICLE

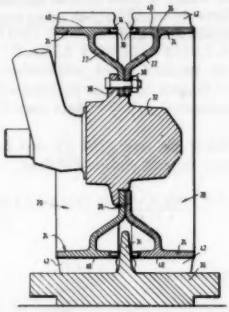
Michael F. Edwards, Wolverhampton; John Barlow, Willenhall; Frederick A. Foreman, Wolverhampton, and Gwynne Williams, Edgemond, Nr. Newport, all of England, assignors to GKN Technology Limited, Wolverhampton, England

Continuation-in-part of Ser. No. 240,956, Mar. 5, 1981, abandoned. This application Aug. 16, 1983, Ser. No. 524,016

Int. Cl.[3] **B62D** *55/08*

U.S. Cl. 305—56 **4 Claims**

1. A support wheel for a track-laying vehicle comprising a pair of light metal wheel elements secured together, each wheel element comprising a disc and a rim, the two wheel elements being secured together by their discs thus to provide a continuous groove between the adjacent edges of the rims for accommodating the horns of a track to be supported on said rims, said adjacent rim edges each being provided with reinforcement for resisting wear imparted thereto by the track horns characterised in that the reinforcement at each of said adjacent rim edges comprises a set of circumferentially spaced apart hard metal studs welded onto and supported by a hard metal support wire, all of said studs and their support wire



being embedded within the rim edge and bonded to the light metal of which the respective rim is formed.

4,538,861

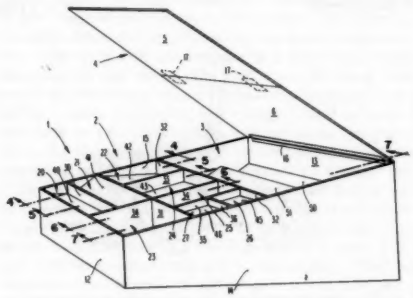
PORTABLE DESK

David P. Hughes, Jr., 950 Hobbs Rd., Radnor, Pa. 19087

Filed Dec. 19, 1983, Ser. No. 562,857

Int. Cl.[3] **A47B** *95/02;* **A45F** *3/00*

U.S. Cl. 312—244 **1 Claim**



1. A portable desk comprising:

a main housing comprising a bottom wall, front and rear walls connected to and extending upwards from the bottom wall with the rear wall extending upward a greater amount than the front wall, a pair of side walls connected to and extending upwardly from the bottom wall, and the side walls respectively being connected to said front and rear walls and with the upper edges of the front, rear, and side walls lying in a common plane which is oriented at an angle to the bottom wall;

flat cover means for said main housing comprising a front section and a rear section, the front section having a closed position wherein it engages the upper edge of said front wall and respective portions of the upper edges of said side walls and the rear section having a closed position wherein it engages the upper edges of said rear wall and respective portions of the upper edges of said side walls;

front hinge means connecting said front and rear sections and providing for the front section to be pivoted upwardly from its closed position to an open position to provide access to the interior of said main housing;

rear hinge means connecting said rear section to the upper edge of said rear wall and providing for the rear section to

be pivoted upwardly from its closed position to an open position to provide access to the interior of said main housing;

a plurality of divider means each extending upwardly with respect to said bottom wall and each respectively constituting at least one compartment side wall;

platform means positioned above said bottom wall and connected with some of said divider means and with said front and side walls and respectively constituting compartment bottoms;

said compartment side walls, said front and side walls, and said compartment bottoms respectively forming a plurality of small-item supply compartments which can be accessed by pivoting said front section to said open position;

the upper edges of said dividers lying in said common plane and engaging said front section when in the closed position, last said engagement and said engagement of said front section with the upper edges of said side walls and said front wall respectively maintaining items in small-item supply compartment within the same;

flat, rear shelf means connected to said side walls and to said rear wall and said flat surface extending away from the rear wall downwardly toward said bottom wall;

flat, front shelf means connected to said side walls and extending from a position below some of said small-item supply compartments in a direction upwardly away from said bottom wall and toward said rear wall and oriented generally parallel to said rear shelf means;

the space above said front shelf means constituting a large-item supply compartment and the space between said front shelf means and said rear shelf means also constituting a large-item supply compartment, both of the large-item compartments being accessed by pivoting said rear portion to its open position;

said front shelf and said rear shelf each having foot means to limit the toward position of large items stored therein; and

said shelf means and said rear section when the same is in the closed position cooperating to maintain large items stored in said large-item storage compartments within the same.

4,538,862

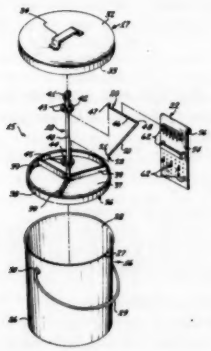
APPARATUS FOR SUPPORTINGLY ORGANIZING MISCELLANEOUS ARTICLES

Earl E. Chandler, P.O. Box 1624, Coolidge, Ariz. 85228

Continuation-in-part of Ser. No. 261,600, May 7, 1981, abandoned, which is a continuation-in-part of Ser. No. 229,339, Jan. 29, 1981, Pat. No. 4,387,940, which is a continuation-in-part of Ser. No. 123,387, Feb. 21, 1980, Pat. No. 4,273,394, which is a continuation-in-part of Ser. No. 937,543, Aug. 28, 1978, Pat. No. 4,225,202. This application Sep. 13, 1982, Ser. No. 416,969

Int. Cl.[3] **A47B** *81/00*

U.S. Cl. 312—283 **13 Claims**



1. A portable apparatus for supportingly carrying miscellaneous articles in an organized manner comprising in combination:

(a) a pail enclosure defining an internal chamber which is closed on one end and open on the other; and

(b) a free standing article support/organizer demountably carried in the internal chamber of said pail enclosure and supported by the closed end of said pail enclosure, and including,

I. a planar tray having an upstanding peripheral flange,

II. an elongated rod extending upwardly from the center of said tray,

III. an upper disc fixed on said rod adjacent the upper end thereof and disposed to lie in a plane transverse to the longitudinal axis of said rod,

IV. a lower disc fixed on said rod in downwardly spaced relationship with said upper disc and substantially parallel therewith,

V. at least five cantilever arms mounted in radially spaced increments about said rod on said upper and lower discs and each pivotably movable about different vertical axes which pass through said upper and lower discs,

VI. at least five rigid panels each demountably suspended from a different one of said plurality of cantilever arms,

VII. fastener-container means on each of said panels for supportingly carrying the miscellaneous articles in an organized manner.

4,538,863

INDUCTIVE CONNECTORS

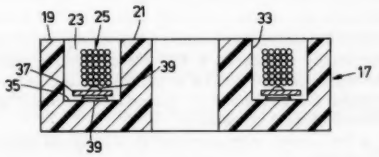
John Allen, and David Pearce, both of Avon, England, assignors to Marconi Avionics Limited, England

Filed Aug. 13, 1982, Ser. No. 408,671

Claims priority, application United Kingdom, Aug. 17, 1981, 8125057

Int. Cl.[3] **H01R** *11/30*

U.S. Cl. 339—12 R **6 Claims**



1. A make and break inductive connector for transferring alternating current electrical energy, said connector comprising

(A) two separable parts, each comprising

(i) a body portion

(ii) a magnetic core member housed in said body portion, and

(iii) a winding associated with said core member;

(B) said two parts being adapted to be brought together so that the core members of the two parts together form a magnetic circuit linking the two windings of said two parts so that electrical energy can be transferred from one part to the other by transformer action between the two windings; and

(C) wherein, in each said part

(i) said body portion is of generally cylindrical form having a cavity extending therein from an end face adapted to abut the corresponding face of the body portion of the other part when said two parts are brought together,

(ii) said magnetic core member is disposed within said cavity and is of generally cylindrical form with an annular cavity extending therein from an end face,

(iii) said end face of the core member is at least approximately flush with said end face of the body portion;

(iv) said winding is of toroidal form and is disposed in said core member cavity, and

(v) a matrix of a potting compound occupies the otherwise free space within said body portion cavity, including the cavity of the core member, so as to enclose completely said winding, and preclude any direct contact between said winding and the core member.

4,538,864

CONTACT ELEMENT WITH LOCKING MEANS

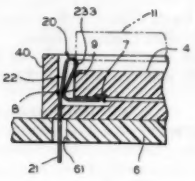
Yoshiaki Ichimura, Tokyo, Japan, assignor to Japan Aviation Electronics Industry, Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 570,749

Claims priority, application Japan, Jan. 18, 1983, 58-6421

Int. Cl.³ H01R *23/72*

U.S. Cl. 339—17 CF **15 Claims**



1. A contact element formed of an elastic metal material for electrically connecting a first planar electric circuit board having a terminal pad on a bottom surface and adjacent a peripheral edge thereof to a second electric circuit board, said contact element comprising:

a first portion to be supported on said second electric circuit board;

a second portion extending from one end of said first portion;

a third portion being bent at the extended end of said second portion and extending therefrom along said second portion with a space therebetween, said third portion having a small protrusion portion projecting away from said second portion to make a downwardly directed step portion on the surface thereof; and

a fourth portion being turned at the extended end of said third portion to extend away from said second portion, said fourth portion having an upwardly directed contact portion to be elastically pressed onto the pad of said first circuit board, said contact portion and said step portion being positioned to be in directions separated by an acute angle as seen from said turning point between said third and fourth portions, whereby said first circuit board may be maintained in a position where the terminal pad is in contact with said contact portion when said first circuit board is pushed down to engage the upper peripheral edge thereof with said setp portion, with said step portion supporting an external force applied to said first circuit board in a direction of said contact element by engagement with the peripheral edge of the circuit board to block motion thereof in its own plane, as well as downwardly retaining said first circuit board.

4,538,865

DEVICE FOR CONNECTING PRINTED WIRING BOARDS OR SHEETS

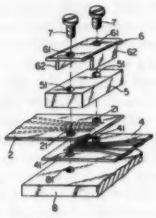
Tsutomu Wakabayashi, Tokyo, and Mikihito Furuya, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,762

Claims priority, application Japan, Feb. 8, 1983, 58-16093[U]

Int. Cl.³ H01R *23/66*

U.S. Cl. 339—17 F **3 Claims**



1. A device for mutually connecting a plurality of printed wiring boards or sheets, in which electrically conductive contacts provided on the surface of each of the printed wiring boards or sheets can be brought into mutual contact by overlapping their surfaces with the conductive contacts formed thereon, said device comprising:

(a) a base plate, on which said plurality of overlapped printed wiring boards or sheets are mounted;

(b) means for positioning said overlapped printed wiring boards or sheets on said base plate, said means including a pressing member having a top part disposed substantially in parallel with the surface of said boards or sheets and at least a pair of side walls having a predetermined height and extending downward from the top part to a surface of said boards or sheets and an elastic member of a thickness greater than the height of said side walls and disposed in the space between said pair of side walls;

(c) said pressing member having a plurality of through holes and a protrusion projected from the surface of said top part opposite to said elastic member toward said overlapped printed wiring boards or sheets, the protrusion being located between the through holes;

(d) said elastic member having a plurality of through holes corresponding to the positions of the through holes of said pressing member; and

(e) pressure applying means which pass through said holes of said pressing member and corresponding holes of said elastic member, respectively, to fasten said pressing member to said base plate to apply a pressing force to the electrically conductive contacts on said printed wiring boards or sheets through said elastic member.

4,538,866

BACKPLANE CONNECTOR

Lennart B. Johnson, Milford, N.H., assignor to Teradyne, Inc., Boston, Mass.

Filed Mar. 7, 1983, Ser. No. 473,037

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—17 LM **4 Claims**

1. The combination comprising

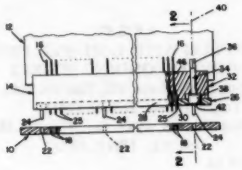
a backplane having a plurality of guide pin holes through said backplane and a plurality of backplane contacts provided by plated-through contact holes through said backplane,

a daughter printed circuit board, and

a daughter board connector carrying a plurality of guide pins and a plurality of daughter board contacts in a connector piece of insulating material,

said daughter board contacts having first portions electri-

cally connected to components on said board, second portions extending from said daughter board perpendicular to it, and third portions perpendicular to said second portions and having free ends extending from said connector for mating with respective said contact holes, said guide pins also extending from said connector in the same direction as said free ends for mating with said guide pin holes,



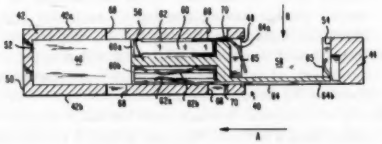
said daughter board connector having a cam plate slidably mounted relative to said connector piece and having holes through which said free ends of said contacts pass and cam means for translating said plate and thereby applying a force between said guide pins and said free ends so that a normal force is provided between said guide pins and said free ends and the sides of said plated through holes.

4,538,867

SOCKET ASSEMBLY CONNECTOR FOR AN ELECTRICAL COMPONENT

Albert H. Wilson, Los Angeles, and Amir-Akbar Sadigh-Behzadi, Van Nuys, both of Calif., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Feb. 17, 1984, Ser. No. 581,381
Int. Cl.³ H01R *23/72*
U.S. Cl. 339—17 CF **17 Claims**



14. An electronic package for accommodating an integrated circuit comprising:

a housing having a first open face and a central channel therein in communication with said open face, said housing having a second face including connection accessing means for providing electrical connection access;

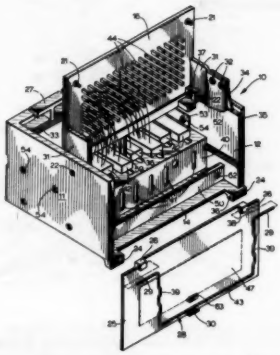
a tray for removably accommodating said integrated circuit, said tray being insertably received in channel of said housing through said first open face by slidable movement in a first direction, said tray having a first extent including a plurality of electrical contacts alignable with said connection accessing means of said housing and a second extent including an exteriorly opening cavity for insertable removable receipt of said integrated circuit, said tray being slidably movable in said housing channel from a first position wherein said tray cavity is exterior said housing to a second position wherein said cavity is interior said housing, said contacts of said first extent being electrically engageable with said integrated circuit upon movement of said tray to said second position.

4,538,868

TERMINAL BLOCK

Thomas W. Cruise, Coon Rapids, and Thomas N. Milbrandt, Lakeville, both of Minn., assignors to Magnetic Controls Company, Minneapolis, Minn.

Filed Sep. 7, 1982, Ser. No. 415,025
Int. Cl.³ H01R *13/44*
U.S. Cl. 339—34 **8 Claims**



1. A terminal block comprising:

a housing having a pair of generally parallel side walls, each of said side walls having a lower forward corner;

a connector panel with forward and rearward surfaces rotatably mounted between said side walls about a first axis perpendicular to said side walls, said connector panel including a plurality of connector elements providing connection portions on both its forward and rearward surfaces and being rotatably moveable between a first position in which access to the connection portions on the forward surface of said panel is provided and a second position in which access to the connection portions on the rearward surface of said panel is provided;

first means for releasably retaining said connector panel in its first position;

second means for releasably retaining said connector panel in its second position; and

a front door having an inside and an outside surface pivotally secured to said housing near the lower, forward corner of said side walls by a wire hinge member and about a second axis generally parallel to said first axis, said wire hinge member comprising a pair of ends lying on a common axis for pivotally securing said front door to said housing and an intermediate section integrally joined with said pair of ends and extending over a portion of the inside surface of said front door, each of said pair of ends extending through a portion of said front door and a portion of said housing.

4,538,869

ELECTRICAL CONNECTOR HOUSING

Craig D. Richards, Boiling Springs, Pa., assignor to AMP, Harrisburg, Pa.

Filed Mar. 27, 1984, Ser. No. 593,223
Int. Cl.³ H01R *13/422*
U.S. Cl. 339—59 M **5 Claims**

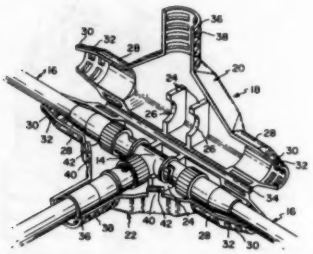
1. An electrical connector housing for enclosing a T-shaped electrical connector connected to electrical cables, comprising:

substantially identically-shaped housing members hingedly connected along straight sides;

each of said housing members having a hollow body section in which spaced projections are located, said spaced projections including arcuate recesses to accommodate the

T-shaped electrical connector to maintain the connector in position when the housing members are in a closed position;

semicircular sections extend outwardly from respective sides of the body sections and form tubular members to cover parts of the connector when the housing members are in the closed position, said semicircular sections including part-conical sections that cover the cables adjacent the connector when the housing members are in the closed position;



part-tubular sections extend outwardly from the bottom of the body sections and form a tubular member when the housing members are in the closed position to cover another part of the connector; and

flexible latch members on one of the housing members for latchably engaging latching surfaces on the other of the housing members to latch the housing members together covering the connector.

4,538,870

ELECTRICAL CONNECTORS

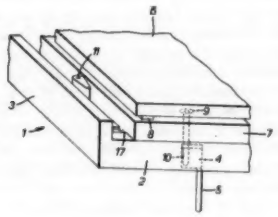
Alan Thewlis, Moorside, Great Britain, assignor to International Computers Limited, London, England

Filed Apr. 6, 1984, Ser. No. 597,681

Claims priority, application United Kingdom, Apr. 7, 1983, 8309402

Int. Cl.³ H01R *13/629*

U.S. Cl. 339—75 M **4 Claims**



1. An electrical connector for a multi-pin circuit module having an array of connection pins extending from one face including:

a carrier plate of insulating material having a plurality of ridges on one surface, the ridges having a width between opposite edges which is less than the diameter of the connection pins, the carrier plate also having a plurality of holes corresponding one with each of the connection pins and extending through the plate and the ridges so that when the circuit module is supported on the carrier plate the connection pins extend through the holes with portions exposed at the opposite edges of the ridges;

an insulating base member carrying a plurality of contact elements corresponding one with each of the connection pins and having inwardly facing turned over portions for engaging the contact pins therebetween;

means for slidably mounting the carrier plate on the insulating base member so that the ridges extend between the turned over portions of the contact elements; and means operable to cause the carrier plate to slide so that the said exposed portions of the connection pins engage the turned over portions of their corresponding contact elements.

4,538,871

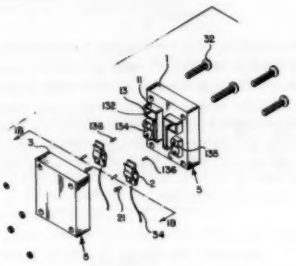
SET OF PLUG WITH L-SHAPED PINS AND CORRESPONDING SOCKET

Chiu-shan Li, No. 133-2, Lane 163, San Ho Rd., Section 4, San Chung City, Taipei Hsien, Taiwan (241)

Filed Feb. 15, 1983, Ser. No. 436,666

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—75 M **3 Claims**



1. An electrical plug and socket comprising:

a multi-prong plug wherein the connector prongs are L-shaped members extending from the plug so that one leg of the L extends longitudinally outwardly from said plug and the other leg of the L extends substantially perpendicular to said one leg from the outer end thereof;

a receptacle housing comprised of a hollow back part and a front cover attached to said back part;

L-shaped slots through said cover conforming to said L-shaped prongs having one leg of each slot adapted to receive said other leg of a respective prong inserted therethrough and the other leg of each slot adapted to allow movement of said inserted prongs transversely with respect to the direction of insertion;

a pair of electrical contact seats for each inserted prong comprising a first seat member attached to the inner surface of said cover and a second seat member attached to the inner surface of said back part in cooperative relationship with said first seat member so that when said cover is attached to said back part, said first and second seat members are juxtaposed in relative spaced relationship;

a pair of electrical contacts having a slot opening mounted on each one of said first seat members so that when said first and second seat members are juxtaposed said contacts are held between said seat members; and

means to resiliently urge each pair of contacts together so that said slot opening slidingly and resiliently grips said other leg of an inserted respective L-shaped prong;

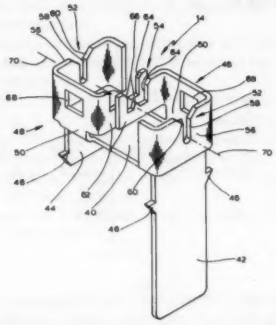
said seats being positioned with respect to said L-shaped slots so that they are displaced from the inserted ends of said L-shaped prongs when first inserted, but said slot openings in said contacts receive said inserted ends of said prongs when said plug is linearly moved transversely to the direction of insertion and after insertion, so that said plug cannot be withdrawn from said housing and disconnected from said contacts after said linear transverse movement by movement parallel to the direction of insertion.

4,538,872

ELECTRICAL CONTACT FOR TERMINATING INSULATED CONDUCTORS

Weldon L. Brubaker, Lisle, and Arnold A. Case, St. Charles, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Nov. 7, 1983, Ser. No. 549,109
Int. Cl.³ H01R *13/39*
U.S. Cl. 339—97 P **4 Claims**



1. An integral stamped electrical contact member for establishing an electrical connection between a conductor of an insulated wire and an external circuit, the contact member including first and second spaced-apart electrical connection means, each having a wall portion with opposed insulation displacing edges forming a conductor-receiving, insulation-displacing slot,

the improvement wherein said contact member comprises:

deflectable insulation piercing means colinearly aligned with said slots and disposed therebetween whereby said piercing means engages a piercable conductor and is deflected by an inpiercable conductor.

4,538,873

CONNECTOR STRUCTURE FOR FLAT CABLE

Sidney V. Worth, Flourtown, Pa., assignor to Continental-Wirt Electronics Corp., Southampton, Pa.

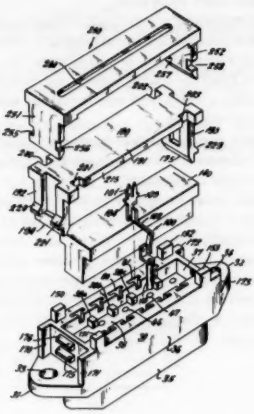
Continuation of Ser. No. 951,629, Oct. 16, 1978, Pat. No. 4,428,637. This application Nov. 30, 1983, Ser. No. 539,688
The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.
Int. Cl.³ H01R *13/39*
U.S. Cl. 339—99 R **11 Claims**

1. An array of a plurality of identical electrical contact members for connection to the round conductors of a multi-conductor flat cable; said contact members being supported in spaced relation to one another in a first flat plane which extends normal to said multi-conductor flat cable and each comprising an elongated electrically conductive thin sheet metal stamping having

(a) an upper bifurcated tail portion with a pair of laterally spaced sharply edged tines adapted to pierce the insulation casing of said flat cable to electrically contact a conductor of said cable,

(b) a lower elongated nose portion for connecting said contact member into an electrical circuit, and

(c) an intermediate single strut portion connecting together said tail and nose portions of said contact member; said intermediate portion being bent substantially central of its overall length into an angular configuration readily bendable to a variable degree to permit changing of the distance between the outer free ends of said upper bifurcated tail portion and said lower elongated nose portion, with the extremities of the said tail portions respectively



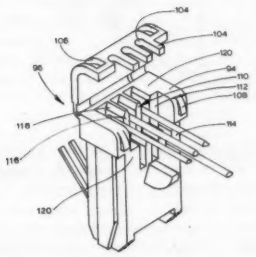
aligned in parallel straight lines extending normal to the lengthwise axes of said cable.

4,538,874

MODULAR JACK ASSEMBLY

Philip J. Dambach, Naperville, and B. Alan Berg, Wooddale, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Continuation of Ser. No. 382,392, May 27, 1982, abandoned. This application Aug. 24, 1984, Ser. No. 644,146
Int. Cl.³ H01R *11/20*
U.S. Cl. 339—99 R **4 Claims**



1. An electrical jack assembly adapted to electrically mate with an electrical plug which has a plurality of electrical plug contacts mounted therein, said jack assembly including

a receptacle housing having a forward plug-receiving end and a rearward end, said housing further having a first socket portion with a plug-receiving opening extending into the forward end arranged to removably and telescopically receive said plug, said receptacle housing further having a second socket portion adjacent the first socket portion with a jack contact connector opening extending into the rearward end,

a discrete jack contact connector adapted to be removably and telescopically received through said jack connector opening into said second socket portion, said connector having a connector housing with a plurality of wire receiving receptacles formed therein and plurality of jack contacts having spring portions adapted to electrically engage said plug contacts when both the jack contact connector and plug are received in said receptacle hous-

ing, said jack contacts each having a wire mating portion disposed in a wire receiving receptacle and adapted to electrically contact an insulated wire conductor received in said wire receptacle,

the improvement in said jack contact connector comprising:

said wire receptacles are arranged in two rows so that every other receptacle is in a different row, each of said two rows lying in planes which are offset from each other, forming a staggered configuration which is staggered in two dimensions;

said wire mating portion having an insulation displacement slot adapted to slice through the insulation of the wire to touch the conductor;

a hinged cover integrally formed with said connector housing and including strain relief means extending toward the electrically connected wires, said cover being moveable between an initial open position and a closed position wherein said strain relief means traps said wires and serves to prevent accidental withdrawal of the wires from the insulation displacement slots of their respective jack contacts.

4,538,875

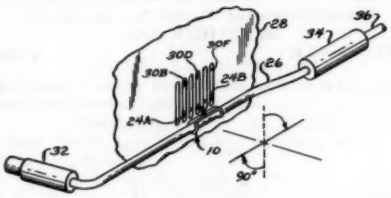
STRAIN RELIEF CLIP FOR ELECTRICAL CABLE

Horst M. Krenz, St. Joseph, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Jul. 12, 1984, Ser. No. 630,150

Int. Cl.³ H01R *13/58*

U.S. Cl. 339—103 R **9 Claims**



1. In an electronic apparatus having an electrical cable coupled thereto and at least one elongated, generally linear ventilation aperture therein, a strain relief clip for securing said electrical cable to said electronic apparatus and preventing relative motion therebetween, said strain relief clip comprising:

a generally cylindrical, first portion open at both ends havinga slot extending the length thereof and adapted to receive the electrical cable along a portion of the length thereof in tight-fitting relation;

an elongated, rigid, generally linear second portion adapted for insertion in said ventilation aperture along the length thereof and for engaging portions of said electronic apparatus immediately adjacent the lateral edges of said ventilation aperture when rotationally displaced after being inserted in said ventilation aperture so as to be aligned generally transverse to the length of said ventilation aperture; and

an interconnecting portion coupling said first and second portions and positioned within and extending beyond said ventilation aperture, wherein the longitudinal axes of said first and second portions are in generally parallel alignment and said first clip portion is in spaced relation from said electronic apparatus to allow for the loose positioning of the strain relief clip within said ventilation aperture in facilitating the positioning upon and removal from the electronic apparatus of the strain relief clip.

4,538,876

ELECTRICAL CONNECTOR

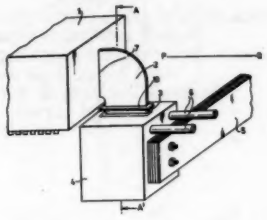
William G. Hall, Shillington, and Peter G. Boswell, Reading, both of England, assignors to Johnson Matthey PLC, London, England

Filed Mar. 22, 1983, Ser. No. 477,851

Claims priority, application United Kingdom, Mar. 22, 1982, 8208269

Int. Cl.³ H01R *4/64, 3/08*

U.S. Cl. 339—118 R **20 Claims**



12. In an electrical connection comprising a metal reservoir in mechanically rigid contact with a current supplying busbar, the reservoir having walls; said reservoir containing: electrically conducting material which is liquid at temperatures of operation; and a current carrying conductor dipping into the electrically connecting liquid to establish electrical contact therewith, and mounted for continuous electrical contact with the electrically conducting liquid during movement of the said current carrying conductor relative to the reservoir caused in use by thermal expansion and contraction of the container and the contents thereof; the improvement comprising:

a powder which is inert relative to the electrically conducting material and disposed therein, the powder significantly increasing the viscosity of at least a portion of the electrical conducting material.

4,538,877

ELECTRICAL BRIDGING CONNECTOR WITH POST SEPARATOR HOUSING

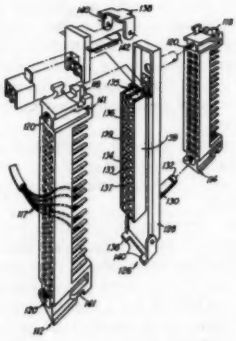
Joseph R. Novis, 3798 Kensington Dr., Marietta, Ga. 30066

Continuation-in-part of Ser. No. 337,578, Jan. 7, 1982, Pat. No. 4,483,577. This application May 3, 1983, Ser. No. 491,206

The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.

Int. Cl.³ H01R *13/50*

U.S. Cl. 339—156 R **5 Claims**



1. A bridging connector for electrically connecting a plural-

ity of wire-wrap posts on a first jack to a like number of pin contactors on a second jack, comprising:

(a) a nonconductive body having a non-conductive post separator housing, the housing comprising two housing walls and a blade member and a plurality of tooth members disposed between the housing walls;

(b) a plurality of contacts disposed in the body for contact with the posts on the first jack; and

(c) a plurality of pins electrically connected to the contacts and disposed in the body to be engaged by the contactors in the second jack.

4. A bridging insulator for physically mounting a jack having two bores and a plurality of wire-wrap posts to a second like jack comprising:

(a) a nonconductive body having a non-conductive post separator housing, the housing comprising two housing walls and a blade member and a plurality of tooth members disposed between the housing walls;

(b) a means attached to the insulator for securing the insulator to the first jack; and

(c) at least one stud attached to the body to be received in one of the bores.

4,538,878

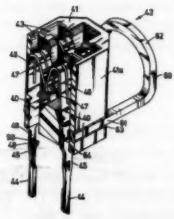
SOLDERLESS CIRCUIT BOARD CONNECTOR

Philip J. Dambach, Naperville, and B. Alan Berg, Huntley, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Aug. 12, 1983, Ser. No. 522,947

Int. Cl.³ H01R *4/24*

U.S. Cl. 339—217 R **3 Claims**



1. A connector assembly that is selectively mountable on a circuit board adapted with a plurality of holes with a conductive plating deposited on the interior surface of said holes, said connector assembly including

an insulative base portion with at least one sidewall having an external surface and a plurality of terminal receiving recesses formed in said base portion, and

a plurality of solderless, elongated electrical terminals, one mounted in each recess, each terminal having a top portion adapted to electrically contact another circuit element and a lower compliant section extending below the base portion adapted to be received in said holes in contact with said plating and allowing selective insertion and withdrawal of said terminals into and out of said holes,

the improvement comprising:

said terminals located adjacent said sidewall and having land portions intermediate said top portion and compliant section;

a slot formed in the external surface of the sidewall providing external access to the recesses and the intermediate land portions mounted therein; and

a tool having an elongated arm that is insertable from the external surface of said sidewall into the slot and extending into the recesses for simultaneous engagement with said land portions for supporting said terminals in said base portion during mounting of said assembly to said board, whereby relative movement of said terminals with respect to said housing is prevented during mounting of said connector assembly by engagement of said tool with said intermediate land portions and said side wall.

4,538,879

MOVABLE FUSE SOCKET SUPPORT FOR USE ON BUS BARS

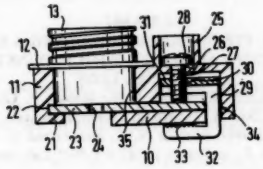
Hans Wagener, Dietzholztal, Fed. Rep. of Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 589,892

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309360; Jan. 12, 1984, 3400805

Int. Cl.³ H01R *13/60, 4/30*

U.S. Cl. 339—22 B **23 Claims**



1. A movable fuse socket support adapted to be attached to bus bars comprises a socket plate which includes a fuse holder and is provided on its underside with fastening means which cooperate with said bus bar and establish good contact between a separate contact plate covering the underside of said fuse holder and said bus bar, characterized in that said contact plate (**23**) has a threaded bore (**24**) coinciding with the center axis of said fuse holder (**35**), that adjacent said fuse holder (**35**) on said underside of said socket plate (**11**) a recess (**34**) is provided in which is disposed C-shaped clamp (**29**) with setscrew (**27**) threadedly engaged in a tapped bore (**30**) on the upper arm of said C-shaped clamp (**29**) adjustable from the upperside of said socket plate (**11**), that said C-shaped clamp (**29**) embraces one end of said contact plate (**23**) together with said bus bar (**10**) and establishes abutting contact between the underside of said contact plate (**23**) and the upperside of said bus bar (**10**), that the opposite end of said contact plate (**23**) is retained in groove (**22**) provided in said socket plate (**11**), and that said setscrew (**27**) is adjustable to tighten said contact plate (**23**) and said bus bar (**10**) relative to each other and against the lower arm of said C-shaped clamp (**29**).

4,538,880

ELECTRODYNAMIC SCANNER AND STABILIZER

Ralph R. Reinhold, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 9, 1982, Ser. No. 406,326

Int. Cl.³ G02B *27/17;* **G02F** *1/29*

U.S. Cl. 350—6.6 **3 Claims**

1. An electrodynamic optical scanner and stabilizer for a pointer and tracker used on a seeking device, the scanner and stabilizer comprising:

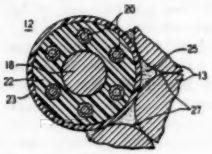
a mounting plate;
a first electrodynamic driver attached to the mounting plate;
a second electrodynamic driver attached to the mounting plate;
control system means connected to the first and second electrodynamic drivers for driving the drivers through drive leads connected to the drivers and receiving position feedback of the drivers through position leads connected to the drivers;
a flexible pivot attached to the mounting plate;
flexible mounts attached to the drivers; and
a reflector attached to the flexible pivot and the flexible mounts of the drivers, the drivers disposed in various predetermined positions adjacent the reflector for moving the reflector on the flexible pivot in a desired scanning pattern, such as conical, rosette and raster among others.

4,538,881

OPTICAL FIBER CABLE INCLUDING A STRAIN EQUALIZING ADHESIVE WHICH CONSTRAINS OPTICAL LOSS

Stephen N. Anctil, Rochester, N.H.; Robert F. Gleason, Freehold, N.J.; Don A. Hadfield, North Hampton; John S. B. Logan, Jr., Dover, both of N.H., and Alfred G. Richardson, Aberdeen, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 24, 1983, Ser. No. 469,430
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.23 **5 Claims**



1. An optical fiber cable comprising a core including
a plurality of optical fibers, each fiber having an optical loss characteristic;
an elastic material embedding the fibers; and
a sheath surrounding the elastic material; stranded wire surrounding the sheath; and
an adhesive bonding the stranded wire to the sheath for equalizing the strain of the fibers, the stranded wire, and the cable and thereby constraining the optical loss characteristic of each fiber to vary only slightly in response to changes of strain ranging from 0–1 percent in the cable.

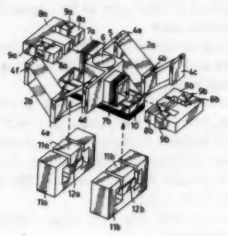
4,538,882

TWO-DIMENSIONAL SUSPENSION

Shinichi Tanaka, Kyoto, and Namio Hirose, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 15, 1982, Ser. No. 418,385
Claims priority, application Japan, Sep. 17, 1981, 56-147664
Int. Cl.³ F16F *1/18, 15/06*; G11B *7/08, 17/32*
U.S. Cl. 350—255 **2 Claims**

1. A focus lens system used for an optical disc recording/reproducing apparatus comprising:
a focus lens;
a holder means for mounting therein the focus lens;
drive means for producing a force to move said focus lens holder means; and
a pair of suspension spring means for suspending said focus lens holder means;
wherein each of said pair of suspension spring means includes:
a plurality of first leaf springs having a first length fixed at one end to a surface of a first rigid wall at a first fixing angle and at the other end to a surface of a second rigid wall at a second fixing angle;
a plurality of second leaf springs having a second length fixed at one end to the other surface of said second rigid wall at a third fixing angle and at the other end to a surface of a third rigid wall at a fourth fixing angle;



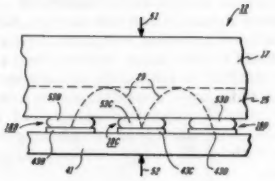
said pluralities of first and second leaf springs forming an oblique angle with the second rigid wall;
a fourth rigid wall being fixed to said focus lens holder means; and
two fixing blocks being disposed at both sides of said focus lens holder means and having said pair of suspension spring means respectively fixed thereto.

4,538,883

CONFORMABLE ELECTRODES FOR PROXIMITY COUPLED ELECTRO-OPTIC DEVICES

Robert A. Sprague, Saratoga, and William D. Turner, San Marino, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 26, 1983, Ser. No. 498,388
Int. Cl.³ G02F *1/03*
U.S. Cl. 350—356 **3 Claims**

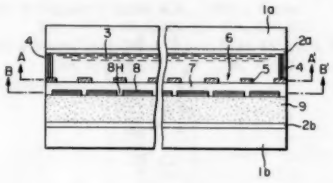


1. In a multigate electro-optic light valve having an electro-optic element, and a plurality of individually addressable electrodes engaged with said electro-optic element for proximity coupling electric fields into said electro-optic element; the improvement wherein
said electrodes include elongated electrical conductors and a relatively soft overcoating deposited on said conductors, said overcoating being selected so that it flows in its solid state to cause said electrodes to conform to said electro-optic element, thereby providing generally uniform surface contact between said electrodes and said electro-optic element.

4,538,884
ELECTRO-OPTICAL DEVICE AND METHOD OF OPERATING SAME

Tatsuo Masaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,051
Claims priority, application Japan, Jul. 10, 1981, 56-108722; Aug. 25, 1981, 56-133149; Aug. 25, 1981, 56-133150; Aug. 26, 1981, 56-134448; Aug. 31, 1981, 56-137163
Int. Cl.³ G02F *1/135*
U.S. Cl. 350—361 **13 Claims**

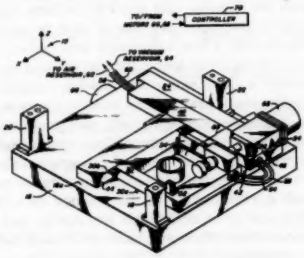


1. An electro-optical device for converting a light input image into a projection image by a photoelectric effect, said device comprising: (A) a liquid crystal layer; (B) a photoconductive layer, including a base layer of at least one of vacuum-deposited Pt, Pd, Au, and Mo, an i-layer, and an n-layer; (C) a shading layer having a plurality of holes therein corresponding to picture elements; (D) a plurality of reflectors, separate from one another, each facing one of said holes; and (E) a light-transmitting insulating layer in contact with said shading layer; said shading layer, said plurality of reflectors, and said insulating layer lying between said liquid crystal layer and said photoconductive layer.

4,538,885
OPTICAL MICROSCOPE SYSTEM

Marshall D. Graham, Framingham; Dudley D. Cook, Jr., Acton; Donald L. Gecks, Bedford, and Robert Shaw, Concord, all of Mass., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jun. 18, 1982, Ser. No. 390,048
Int. Cl.³ G02B *21/24*
U.S. Cl. 350—529 **10 Claims**



1. An optical microscope system for viewing a planar object-bearing surface of a microscope slide, comprising:

A. optics system including means for providing an image of an object in a focal plane,

B. frame member including means for rigidly coupling said optics system thereto and including a frame bearing surface having a substantially planar portion, said planar portion being substantially parallel to said focal plane,

C. stage having a substantially planar stage-to-frame bearing surface and including means for supporting said slide with its object-bearing surface substantially parallel to said stage-to-frame bearing surface, said stage being positioned with said stage-to-frame bearing surface adjacent to said frame bearing surface,

D. stage-to-frame coupling means including:

i. a plurality of air ports in said stage-to-frame bearing surface,

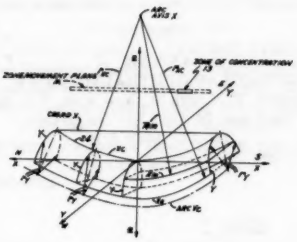
ii. means for coupling air from a relatively high pressure air reservoir to said air ports,

wherein said stage-to-frame coupling means further comprises a plurality of vacuum ports in said stage-to-frame bearing surface and means for coupling vacuum from a vacuum reservoir to said vacuum ports whereby said airflow from said air ports and said vacuum from said vacuum ports maintains said object-bearing surface substantially parallel to said focal plane and establishes a relatively frictionless and relatively stiff coupling between said stage-to-frame bearing surface and said frame bearing surface.

4,538,886
CIRCULAR ARC SOLAR CONCENTRATOR

Donald W. Townsend, and Edward E. Routery, both of Phoenix, Ariz., assignors to Stellar Energy Ststems, Inc., Phoenix, Ariz.

Filed Apr. 19, 1983, Ser. No. 486,314
Int. Cl.³ G02B *5/10*
U.S. Cl. 350—630 **6 Claims**



1. A concentrator and collector in combination comprising:

an anticlastic panel having a surface which is concave along a first axis and convex along a second axis perpendicular to the first axis said surface being defined by concave circular arcs having a central axis X spaced from and above the surface, a radius of the concave circular arcs as measured from the central axis X to a crown arc being less than radii of concave circular arcs as measured from the central axis to first and second edges of the panel,

said surface being further defined by convex circular arcs having a uniform radii with a central axis Y_c of each convex circular arcs, said central axis Y_c being radially spaced from the central axis X of the concave circular arcs; and

collector means moveably disposed above the surface of said panel for collecting light reflected from said panel which is concentrated in a narrow zone of concentration and moves in a single plane parallel to a plane containing said first and second axes.

4,538,887
ASPHERIC SPECTACLE LENS BLANK

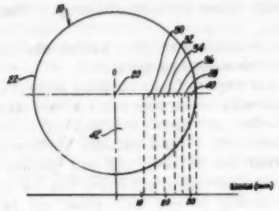
Alexander C. Bristol, 5480 SW. 85 St., Miami, Fla. 33143

Filed Mar. 8, 1984, Ser. No. 587,618
Int. Cl.³ G02B *3/04*; G02C *7/02*
U.S. Cl. 351—167 **2 Claims**

1. A lens blank for an aphakic eye comprising:

a generally circular lens blank having posterior surface and an aspherical anterior surface with an optical center, said anterior surface having a circular central zone encircled

by six concentric zones formed in accordance with the following table:



Zone Number	Diameter (mm)	Power (diopters)
Central zone	23 ± 2	C
First zone	32 ± 2	C - 0.50
Second zone	40 ± 2	C - 1.00
Third zone	47 ± 2	C - 1.50
Fourth zone	53.5 ± 2	C - 2.50
Fifth zone	59.5 ± 2	C - 3.50
Sixth zone	65 ± 2	C - 4.50

where C equals the lens power at said optical center.

4,538,888

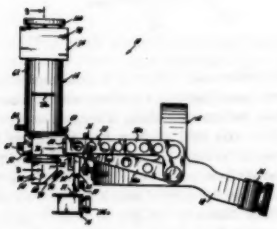
BINOCULAR OPHTHALMOSCOPE

Jesse L. Sigelman, 27 E. 65th St., New York, N.Y. 10021

Filed Jun. 24, 1982, Ser. No. 391,494

Int. Cl.[3] A61B *3/10*

U.S. Cl. 351—205 **7 Claims**



1. An indirect binocular ophthalmoscope, comprising:

an optical viewing system;

light source means having a light outlet for illuminating a patient's eye; and

headgear means mountable on an examiner's head during use for supporting the optical viewing system in optical alignment with the examiner's eyes and the light source means with the light outlet above the optical viewing system;

wherein the light source means includes a cylindrical housing, means for selectively providing both full beam and slit beam illumination of a patient's eye and wherein the headgear means includes means mounting the cylindrical housing for movement only in a lateral direction and for rotation about the axis of the housing independent of the lateral movement to alter the angle of the light beam from the light source means without changing its vertical angulation whereby the user can independently adjust the lateral position of the light beam and angle of the light beam independently and without affecting the vertical angulation.

4,538,889

MANUAL OPHTHALMOSCOPE

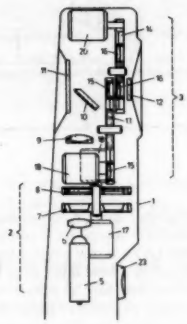
Helmut A. Heine, Herrsching; Helmut W. Rosenbusch, Weilheim, and Otto H. Schmidt, Herrsching, all of Fed. Rep. of Germany, assignors to Heine Optotechnik GmbH & Co., Herrsching, Fed. Rep. of Germany and Propper Manufacturing Co., Inc., Long Island City, N.Y.

Filed Nov. 29, 1982, Ser. No. 445,150

Claims priority, application European Pat. Off., Nov. 10, 1982, 82110379.3; Fed. Rep. of Germany, Dec. 1, 1981, 3147524

Int. Cl.[3] A61B *3/10*

U.S. Cl. 351—205 **3 Claims**



1. An ophthalmoscope for examining a patient's eyes comprising a housing, an illumination system for directing light on the eye under examination, said illumination system located within said housing and including an illumination light path, an optical imaging system rotatable about an axis, said optical imaging system formed of a plurality of parts including at least one of apertures and measuring marks, a first motor for rotating said optical imaging system about said axis to interpose any one of said parts into said illumination light path so as to produce an image of said aperture or measuring mark on the fundus of the eye under examination, an observation system for viewing the eye under examination, said observation system located within said housing and including an observation light path, a gross adjustment lens carrier rotatable about an axis, a plurality of lenses located on said gross adjustment lens carrier, a second motor for rotating said gross adjustment lens carrier about said axis to interpose any one of said lenses into said observation light path, a fine adjustment lens carrier rotatable about an axis, a plurality of lenses located on said fine adjustment lens carrier, a third motor for rotating said fine adjustment lens carrier about said axis to interpose anyone of said lenses into said observation light path, said gross adjustment lens carrier and said fine adjustment lens carrier adapted to cooperate to provide a wide range of refraction values, position detection means located within said housing for generatng position signals corresponding to the position of said optical imaging system, said gross adjustment lens carrier and said fine adjustment lens carrier, display means visible from outside said housing and responsive to said position signals for providing a visual indication of the position of said optical imaging system, said gross adjustment lens carrier and said fine adjustment lens carrier, a plurality of operating elements accessible from outside of said housing and adapted to be operated to drive said second and third motors to respectively rotate said said gross adjustment lens carrier and said fine adjustment lens carrier, computer means located within said housing, said computer means adapted to receive the position signals corresponding to the position of said gross adjustment lens carrier and said fine adjustment lens carrier and provide an output indicative of the refraction of the eye under examination, said display means adapted to receive said output and provide a visual indication of said refraction and said computer means being in communi-

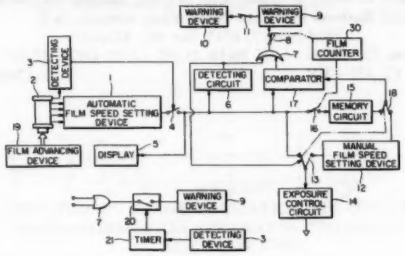
cation with and adapted to drive said first motor to achieve movement of said optical imaging system in response to said output so as to provide a constant clear image of said aperture or measuring mark of said optical imaging system on the fundus of the eye under examination notwithstanding the positions of said gross adjustment lens carrier and said fine adjustment lens carrier.

4,538,890

CAMERA PROVIDED WITH A MECHANISM FOR DETECTING THE FILM SPEED OF A FILM

Sunao Ishizaka, and Osamu Maida, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 10, 1984, Ser. No. 608,802
Claims priority, application Japan, May 16, 1983, 58-85458
Int. Cl.³ G03B *7/24, 1/60, 17/36*
U.S. Cl. 354—21 **11 Claims**



1. A camera into which a magazine containing a film therein and provided with means indicative of information concerning the film speed of the film can be loaded, said camera including:

(a) means for detecting the film speed of said film on the basis of said information when said magazine is loaded into said camera and producing a first film speed signal indicative of said detected film speed;

(b) means for manually setting the film speed of said film and producing a second film speed signal indicative of said set film speed of said film;

(c) means for detecting the difference between the film speeds of said film indicated by said first and second film speed signals and producing a warning signal in response to the presence of said difference between the film speeds of said film indicated by said first and second film speed signals;

(d) warning means operable in response to said warning signal;

(e) means for drawing out the film from said loaded magazine; and

(f) means for hindering operation of said warning means in response to the draw-out of a predetermined amount of film from said magazine regardless of the production of said warning signal.

4,538,891

DEVICE FOR SETTING PHOTOGRAPHIC INFORMATION FOR CAMERA

Shinichi Matsuyama, Tokyo, and Masami Shimizu, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

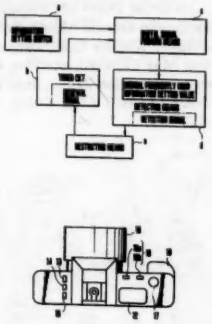
Filed Aug. 28, 1984, Ser. No. 645,011
Claims priority, application Japan, Aug. 29, 1983, 58-157588; Jan. 10, 1984, 59-002430
Int. Cl.³ G03B *7/08*
U.S. Cl. 354—289.1 **9 Claims**

1. A device for setting photographic information, etc., comprising:

(a) an operation member for information setting operations;

(b) an information forming circuit arranged to periodically renew the setting value of said information from one value to another in response to the operation of said operation member; and

(c) a control circuit which extends the period of said periodical renewal when the value of information set by said



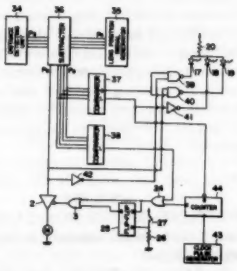
information forming circuit becomes a specific value to have a longer period for renewal of said specific value into another than the period provided for renewal of other values.

4,538,892

AUTOMATIC FOCUS CONTROL SYSTEM

Shinji Sakai; Yoshihito Harada, both of Tokyo; Akira Ishizaki, Yokohama, and Takashi Kawabata, Kamakura, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1983, Ser. No. 515,617
Claims priority, application Japan, Jul. 28, 1982, 57-130395
Int. Cl.³ G03B *13/18*
U.S. Cl. 354—402 **3 Claims**



3. An automatic focus control system comprising:

(a) distance detecting means for outputting a distance signal corresponding to a distance of an object to be photographed;

(b) lens position signal generator means for outputting a signal corresponding to a position of a focusing lens;

(c) drive means for driving a focusing lens;

(d) means for receiving the output of said lens position signal generator means and the output signal from said distance detecting means to output a focus state signal;

(e) first means, based on the focus state signal, for outputting a signal indicating that said focusing lens is in the quasi-in-focus range;

(f) second means, based on the focus state signal, for outputting a signal indicating that said focusing lens is in-focus; and

(g) time control means for receiving the signal from said first

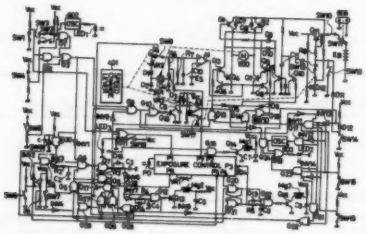
means and for stopping the energization of said drive means after a predetermined time from the receipt of the signal from said first means.

4,538,893

MOTOR DRIVEN CAMERA

Yoshiyuki Nakano, and Osamu Maida, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 25, 1983, Ser. No. 497,830
Claims priority, application Japan, Jun. 1, 1982, 57-93401
Int. Cl.³ G03B *1/18, 7/085, 19/12*
U.S. Cl. 354—412 **19 Claims**



1. A drive device for a camera comprising:
(a) an electric motor;
(b) stop drive means adapted to be driven by said electric motor to change a stop aperture of a lens;
(c) means for measuring the brightness of a subject to be photographed, and which generates an electric signal when said stop aperture which is changed reaches a predetermined aperture adaptive to the brightness of said subject;
(d) means for stopping said stop drive means in response to said electric signal;
(e) film wind-up means adapted to be driven by said electric motor to wind up a film frame by frame; and
(f) control means for causing said electric motor to make a first rotation to drive said stop drive means prior to exposure of the film and causing said electric motor to make a second rotation to drive said film wind-up means after the exposure of the film, said control means including means for varying the rotating speed of said electric motor for said second rotation and means for adjusting the rotating speed of said electric motor to a determined speed for said first rotation.

4,538,894

WARNING DEVICE FOR CAMERAS

Hideto Shirane, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 13, 1983, Ser. No. 541,738
Claims priority, application Japan, Oct. 19, 1982, 57-183362
Int. Cl.³ G03B *17/18;* **G08B** *19/00*
U.S. Cl. 354—467 **5 Claims**

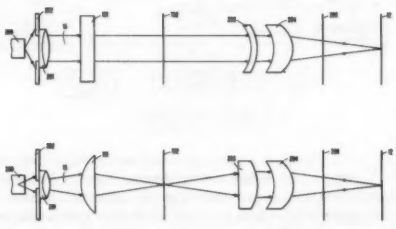
1. A warning device to be incorporated in a camera for giving warning statements in synthesized human speech, said warning device comprising:
means for generating a warning signal corresponding to a condition interferring with the proper operation of a camera;
power supply means which is caused to operate only by said warning signal;
an amplifier which is adapted to receive electric power through said power supply means;
means for delaying said warning signal a predetermined period of time which is equal to the time which is required for the amplifier to attain a desired amplification factor;
an acoustic signal generating circuit for generating synthesized acoustic signals convertible into a statement in synthesized human speech upon receiving said delayed warning signal, said synthesized acoustic signals being then directed to said amplifier; and
a speaker through which said synthesized acoustic signals from said amplifier is imparted as a warning statement in synthesized human speech;
said delaying means delaying said warning signal said predetermined period of time after said amplifier has received electric power, whereby said amplifier is powered said predetermined period of time prior to the generation of said synthesized acoustic signals.

4,538,895

SCANNING OPTICAL SYSTEM FOR USE WITH A SEMICONDUCTOR LASER GENERATOR

Robert C. Higgins, Broomfield; Mikel J. Stanich, Louisville, and Larry L. Wolfe, Broomfield, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,430
Int. Cl.³ G03G *15/04;* **B41B** *21/08, 13/00;* **G02B** *27/30*
U.S. Cl. 355—3 R **6 Claims**



1. An optical system in combination with a semiconductor laser light source for producing a light beam, said system being adapted to scan said eight beam produced by said source across a photoreceptive surface, comprising:
said semiconductor laser light source for producing said light beam;
an achromatic lens means to receive light produced by said light source and for compensating variations in the wavelength of light produced by said light source, said variations occurring over a period of time;
reflecting means for reflecting said beam to move said beam in a scanning fashion;
a cylindrical lens means for receiving said beam from said achromatic lens means and for focusing said beam onto the surface of said reflecting means; and
a combination of lenses to receive said beam reflected from said reflecting means to focus said beam onto said photoreceptive surface.

6. An electrophotographic printing machine comprising:
photoreceptive material mounted on supporting means;
motive means connected to said supporting means to cause said photoreceptive material to move in a cyclic manner;
charge generating means for charging said photoreceptive material;
exposure means for selectively discharging said photoreceptive material, said exposure means including a semiconductor laser chip for producing a light beam modulated according to digitized information desired for reproduction, an achromatic doublet lens and aperture means for receiving said beam from said chip and for compensating variations in wavelength of the light beam produced by said laser chip, said variations occurring over a period of time, for counteracting astigmatism effects, for counteracting variations in the distance between the plane of emission of said beam and the plane of said achromatic doublet lens and aperture means, for counteracting varia-

tions in beam size in perpendicular planes, for counteracting variations in the divergence angle of emission of said beam from said laser chip, and for collimating said light beam, a cylindrical lens means for receiving said collimated light beam and focusing said beam onto a moving reflection surface, and a combination of lenses for receiving said beam from said moving reflection surface and focusing said beam onto said photoreceptive surface such that said beam repeatedly scans across said surface to produce an image thereon;

developing means for developing said image;

transfer means for transferring said image to print receiving material; and

fuser means for fusing the transferred image to said print receiving material;

whereby a print is produced to visually reproduce that information used to modulate said beam.

4,538,896

UNIT FOR AN IMAGE FORMATION APPARATUS AND IMAGE FORMATION APPARATUS PROVIDED WITH THE SAME UNIT

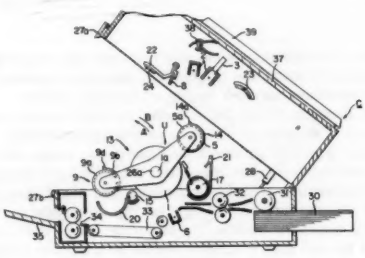
Hatsuo Tajima, Matsudo; Tohru Takahashi, Tokyo, and Nagao Hosono, Chofu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 356,026, Mar. 8, 1982, abandoned. This application Jul. 20, 1984, Ser. No. 633,061

Claims priority, application Japan, Mar. 18, 1981, 56-38892

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—3 R **33 Claims**



1. An image forming apparatus for forming an image on a transfer medium, said apparatus comprising:

An expendable interchange unit detachably mounted to said image forming apparatus and including at least a non-refillable supply means for storing a predetermined amount of developer and an image bearing member having a service life corresponding essentially to the developer capacity of said supply means;

means for forming an image on said image bearing member;

means for developing the image formed on said image bearing member with developer from said supply means; and

means for transferring the developed image to a transfer medium;

wherein said interchange unit is discardable and replaceable with another unit upon the substantial consumption of the predetermined amount of developer in said supply means, thereby avoiding periodic replenishment of developer during the service life of said image bearing member.

4,538,897

LATENT ELECTROSTATIC IMAGE DEVELOPING APPARATUS

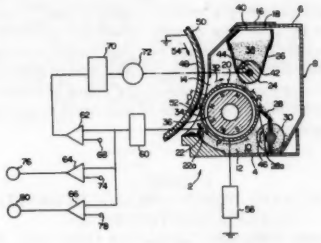
Haruya Osaka; Takashi Maekawa, both of Osaka, and Yoshihiro Nakajima, Daito, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 4, 1983, Ser. No. 472,121

Claims priority, application Japan, Mar. 31, 1982, 57-51259

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 DD **10 Claims**



1. In an apparatus for developing a latent electrostatic image, said apparatus being of the type comprising a developer receptacle containing a developer composed of carrier particles and toner particles, a developer applying mechanism for holding on its surface a part of the developer in the developer receptacle and applying it to a latent electristatic image to be developed, a toner receptacle containing toner particles, and a toner supplying mechanism to be selectively operated to supply toner particles to the developer in the developer receptacle from the toner receptacle, the improvement wherein said apparatus further comprises:

detecting means for detecting the electrical conductivity of the developer in said developer receptacle; and

carrier degradation signal producing means for, when the electrical conductivity of the developer detected by said detecting means falls below a predetermined carrier degradation reference value, producing a signal showing that the carrier particles in the developer have been degraded.

4,538,898

DEVELOPING DEVICE

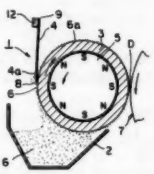
Fuchio Kanno, Yokohama; Toshio Kaneko, and Koji Sakamoto, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Nov. 10, 1982, Ser. No. 440,713

Claims priority, application Japan, Nov. 10, 1981, 56-178968; Nov. 18, 1981, 56-183659; Nov. 18, 1981, 56-183658; Dec. 12, 1981, 56-200342; Dec. 30, 1981, 56-211533

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—3 DD **23 Claims**



1. A developing device for developing an electrostatic latent image by bringing a film of developer close to said latent image, said device comprising:

a tank for containing therein a quantity of developer;

developer carrying means for carrying thereon said developer, said developer carrying means being driven to move along a predetermined path including a developing region where said electrostatic latent image is developed by said developer;

means for attracting said developer to said developer carrying means;

means for forming a film of developer having a predetermined thickness on said developer carrying means after said developer, supplied at least partly from said tank, has been attracted to said developer carrying means, said means for forming being disposed in the upstream of said developing region and including a pressure plate having a base end supported by a housing of said device and a forward end pressed against said developer carrying means such that said forward end is directed against the direction of movement of said developer carrying means at the points of contact; and

means for controlling the amount of said developer to be supplied to said means for forming.

4,538,899

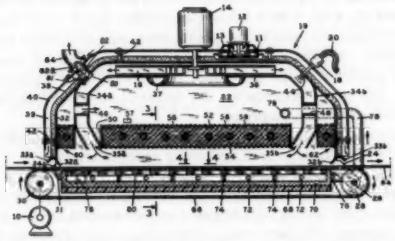
CATALYTIC FIXER-DRYER FOR LIQUID DEVELOPED ELECTROPHOTOCOPIERS

Benzion Landa, Edmunton, Canada, and Oded Sagiv, Ramat-Gan, Israel, assignors to Savin Corporation, Stamford, Conn.

Filed Feb. 22, 1983, Ser. No. 468,507

Int. Cl.³ G03G *15/00, 15/12*

U.S. Cl. 355—10 **67 Claims**



1. An electrophotocopier including in combination means for producing a latent electrostatic image on an imaging surface, means including a liquid developer comprising charged toner particles dispersed in a dielectric liquid hydrocarbon carrier for developing said latent image, means for transferring the developed image from said surface to a copy sheet, means for oxidizing carrier liquid transferred to the copy sheet concomitantly with the developed image to produce hot gaseous oxidation products, and means for directing said hot oxidation products against the copy sheet to dry and fix the transferred image by vaporizing transferred carrier liquid.

4,538,900

ELECTROPHOTOGRAPHIC COPYING APPARATUS INCLUDING DRUM CONDITIONING APPARATUS AND METHOD

Arthur C. Lutus, Redwood City, and Victor B. van Blerk, San Jose, both of Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,113

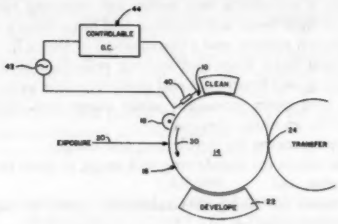
Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 CH **12 Claims**

1. Conditioning apparatus for establishing or removing background charge levels on a photoconductive recording surface in preparing said surface for reuse in an electrophotographic copying system, comprising

a single light discharge means for selectively emitting red or green light; and

a single power supply connected to said light discharge means and variable between two different output signals,



said first signal level causing discharge of red light only and a second signal causing discharge of green light only.

4,538,901

ELECTROPHOTOGRAPHIC COPIER WITH A PHANTOM IMAGE SUPPRESSION FUNCTION

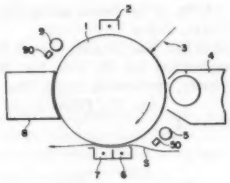
Norimasa Soumiya, Soka, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jan. 19, 1984, Ser. No. 572,294

Claims priority, application Japan, Jan. 20, 1983, 58-7748; May 20, 1983, 58-88724

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—14 E **15 Claims**



1. An electrophotographic copying machine capable of suppressing the formation of phantom images, comprising:

a photosensitive member having an imaging surface;

image forming means for forming an electrostatic latent image of an original image on said imaging surface;

developing means for developing said latent image thereby converting said latent image into a visible toner image;

first irradiating means for irradiating said toner image on said imaging surface with light having a first light amount;

transfer means for transferring said toner image thus irradiated by said first irradiating means to a transfer medium from said imaging surface;

second irradiating means for irradiating said imaging surface with light having a second light amount; and

control means for controlling a light amount ratio between said first and second light amounts to stay within a predetermined range.

4,538,902

IMAGE FORMATION APPARATUS

Tsuneki Inuzuka, Machida; Yoshihiro Kawatsura, and Masato Ishida, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 460,683, Jan. 24, 1983, abandoned, which is a continuation of Ser. No. 149,419, May 13, 1980, abandoned. This application Jul. 3, 1984, Ser. No. 626,486

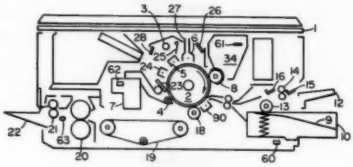
Claims priority, application Japan, May 17, 1979, 54-60791; May 17, 1979, 54-60796; Jun. 8, 1979, 54-72617

Int. Cl.³ G03G *15/20*

U.S. Cl. 355—14 FU **10 Claims**

1. An image formation apparatus comprising means for

forming an image on a sheet fed thereto, means for heat-fixing the image formed on said sheet by said image formation means, said heat-fixing means including an electrically powered heat source, means for detecting the temperature of said heat-fixing means, temperature control means for controlling the electric power supplied to said heat source in accordance with the detected temperature, means for detecting disconnection of an element in said detecting means for detecting the temperature



of said heat-fixing means, malfunction detecting means for detecting a malfunction condition in said apparatus, interruption means for interrupting operation of said apparatus in accordance with an output of said malfunction detecting means, and control means for operating said disconnection detecting means after a predetermined time from a point in time when said apparatus restarts operation after release from the malfunction.

4,538,903

MULTIPLE MAGNIFICATION MODE COPYING APPARATUS

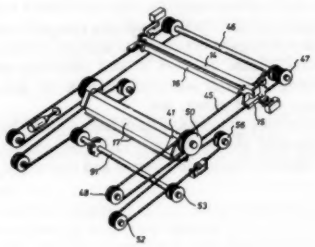
John N. Lane, Leighton Buzzard, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 20, 1983, Ser. No. 534,042

Claims priority, application United Kingdom, Sep. 21, 1982, 8226844

Int. Cl.³ G03B *27/34*

U.S. Cl. 355—57 **2 Claims**



1. A document reproduction apparatus including a document support surface, a full rate scanning system and a half rate scanning system arranged to travel along a path parallel to, and below, said support surface, and a lens for projecting an image of the scanned document onto a photosensitive surface, the apparatus further including an arrangement for detecting a start-of-scan and end-of-scan position and for causing image to copy sheet registration, the arrangement comprising:

a pulley/cable/gear system connected to a main drive shaft for moving said full rate and half rate scanning carriages at speeds required for the particular magnification, an optical notched timing disc operatively connected to said main drive shaft so as to complete one full rotation during one scan excursion of said full rate carriage;

said timing disc having formed on its periphery, a plurality of notches, said notches proportionally distributed on said periphery to conform to various positions of said full rate carriage; and

a light source and photosensor positioned on opposing sides of said disc and adapted to sense the movement therebetween of one of said notches and to generate signals representing at least start-of-scan and end-of-scan positions of said full rate scanning systems.

4,538,904

MULTIPLE MAGNIFICATION MODE COPYING APPARATUS

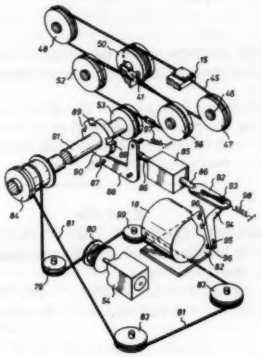
John N. Lane, Leighton Buzzard, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 20, 1983, Ser. No. 534,048

Claims priority, application United Kingdom, Sep. 21, 1982, 8226842; Sep. 21, 1982, 8226843

Int. Cl.³ G03B *27/34*; G03G *15/00*

U.S. Cl. 355—57 **7 Claims**



1. A document reproduction apparatus capable of operating in a plurality of magnification modes including a document support surface, a full rate scanning system and a half rate scanning system arranged to travel along a path parallel to, and below, said support surface and a lens for projecting an image of the scanned document onto a photosensitive surface, the apparatus further including an arrangement for moving the half rate mirror system and lens coincident with a change in magnification, the arrangement comprising;

a first cable and pulley system for moving the lens along the optical path;

a drive motor for driving said first cable and pulley system;

a second cable and pulley system for moving the half rate mirror system independent of the full rate scanning system;

a shaft connecting said first and second cable and pulley system; and

a drive motor for driving said first cable and pulley system, the motion of said first system being transferred, via said interconnecting shaft, to said second cable and pulley system to effect a simultaneous position change of lens and half rate mirror system for the particular magnification.

4,538,905

ELECTRONIC IMAGE REGISTRATION

Deborah B. Griego, Boulder; Joe M. Hopping, Longmont; Teddy A. Rehage, Longmont, and John H. Rhodes, Jr., Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,232

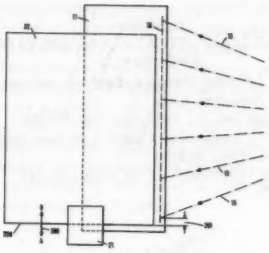
Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 SH **10 Claims**

1. A method for controlling a printing machine to maintain

a desired margin on sheets of print receiving material despite variations from sheet to sheet in the side edge position of said print receiving material, comprising the steps of:

feeding a sheet of said print receiving material from a supply area to a processing station whereat said printing machine places print on said material;



sensing the position of the side edge of said sheet of print receiving material prior to its entry into said processing station;

deriving a factor indicative of the sensed position; and

controlling the placement of said print in accordance with the derived factor so that a desired margin can be maintained on said print receiving material.

4,538,906

COPIERS FOR SIMPLEX AND DUPLEX COPYING

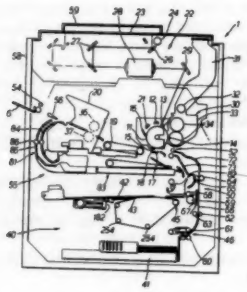
Ian G. Brown, Milton Keynes, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 5, 1984, Ser. No. 617,420

Claims priority, application United Kingdom, Jun. 8, 1983, 8315727

Int. Cl.³ G03B *15/00, 27/32*

U.S. Cl. 355—14 SH **3 Claims**



1. In a copier capable of simplex or duplex copying, including a photoreceptor, first and second copy sheet trays, means for feeding copy sheets from said first and second copy sheet trays to said photoreceptor, and a duplex buffer tray, and further including, for said duplex copying, simplexed sheet recirculation means for conveying simplexed copy sheets, which have received an image on only one side at said photoreceptor, to said duplex buffer tray and for refeeding said simplexed copy sheets back from said duplex buffer tray to said photoreceptor to receive a second image on the other sides thereof, the improvement wherein said means for feeding copy sheets comprises a first sheet feeder associated only with said first copy sheet tray and a second sheet feeder commonly associated with both said duplex buffer tray and said second copy sheet tray, and wherein said second copy sheet tray is mounted for movement between a lowered, operative, position in which it is seated within said duplex buffer tray and operatively associated with said second, common, sheet feeder only for simplex copying, and a raised, inoperative, position in which said second copy sheet tray is spaced over said duplex buffer tray and only said duplex buffer tray is operatively associated with said second common, sheet feeder, and wherein said second copy sheet tray is maintained in said raised, inoperative, position during said duplex copying.

4,538,907

DEVICE FOR DETERMINING DISTANCE OF AREA ILLUMINATED BY PULSED LASER

Luigi Rocchi, Rome, Italy, assignor to Selenia - Industrie Elettroniche Associate - S.p.A., Rome, Italy

Filed Mar. 1, 1983, Ser. No. 471,029

Claims priority, application Italy, Mar. 1, 1982, 47884 A/82

Int. Cl.³ G01C *3/10, 3/08*

U.S. Cl. 356—1 **4 Claims**

1. A system disposed at an observation point for determining the distance therefrom of a nearby target area illuminated by a remote pulsed laser, comprising:

receiving means responsive to pulses of incident laser radiation arriving in rapid succession from two different directions and assumed to be respectively due to direct illumination and to illumination by reflection from a target area;

timing means coupled to said receiving means for measuring the interval elapsed between the arrivals of said pulses;

trigonometic means coupled to said receiving means for calculating the angle included between the directions of incidence of said pulses; and

arithmetic means connected to said timing means and to said trigonometric means for computing an estimate of the target distance from said interval and said angle.

4,538,908

PARTICULATE SAMPLE ANALYZING INSTRUMENT EMPLOYING VIBRATION TO COMPACT THE SAMPLE

Donald R. Webster, Laurel, Md., assignor to Pacific Scientific Company, Anaheim, Calif.

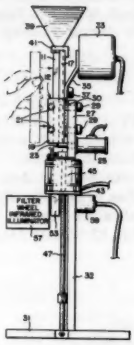
Continuation-in-part of Ser. No. 236,580, Feb. 29, 1981, Pat. No. 4,422,760. This application Sep. 23, 1982, Ser. No. 422,275

Int. Cl.³ G01J *3/48;* **G01N** *1/10*

U.S. Cl. 356—36 **12 Claims**

1. A method of analyzing a particulate sample comprising introducing the sample into a container, vibrating the sample within said container to compact the particulate sample during a first interval, then during a second interval after said first

interval, directing a beam of light onto the sample compacted in said container while said sample is not being vibrated, detecting the intensity of the light from said beam after the light has come in optical contact with said sample.

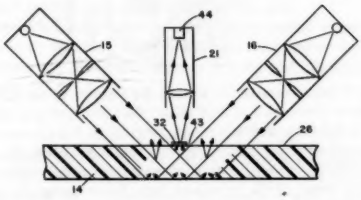


4,538,909

CIRCUIT BOARD INSPECTION APPARATUS AND METHOD

Robert E. Bible; Robert E. Bible, Jr., both of Rancho Santa Fe, and Richard S. Mason, Escondido, all of Calif., assignors to Automation Engineering, Inc., San Diego, Calif.

Filed May 24, 1983, Ser. No. 497,656
Int. Cl.³ G01N *21/32*
U.S. Cl. 356—237 **25 Claims**



1. Apparatus for illuminating a circuit board for inspection thereof, said circuit board having a translucent substrate and conductive circuitry on at least one side thereof, said apparatus comprising:

a frame;

a first carriage mounted to said frame for holding said circuit boards during inspection thereof;

a second carriage mounted to said frame and spaced from said first carriage, at least one of said carriages being movable on said frame and with respect to the other carriage;

first light source means mounted to said second carriage and directed at an oblique angle to the surface to be inspected of said circuit board;

first detector means sensitive to light from said first light source means, said first detector means being mounted to said second carriage in fixed relationship with respect to said first light source means and arranged to detect light in a predefined field of view on the surface of said circuit board; and

means cooperatively arranged with said first light source means to limit illumination of that portion of said circuit board to a predefined area having an edge closely adjacent but spaced from said field of view;

whereby light directed onto said surface by said first light source means penetrates said circuit board, is scattered and reflected therewithin, and illuminates said field of view, said first detector means determining the presence or absence of an opaque conductive element in said field of view by the level of light sensed, said conductive element being opaque with respect to said substrate at the wavelength of said first light source means.

16. A method of inspecting a circuit board having a translucent substrate and conductive circuitry on at least one surface thereof, said method comprising the steps of:

directing at least one beam of light at an oblique angle onto the surface of said board to be inspected;

viewing from above said surface by means of a first detector array a sharply defined field of view, said light beam having a defined edge on said surface closely adjacent but spaced from said field of view;

illuminating said field of view on said surface from within said board by scattering and reflection of said light within said board; and

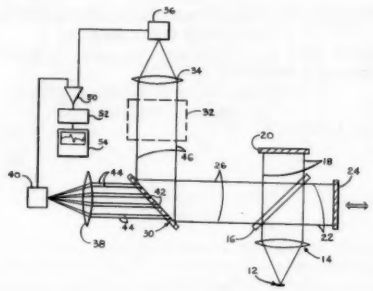
detecting by means of sensors in said detector array light variations on said field of view from the scattered and reflected light within said circuit board indicative of the presence and absence in said field of view of conductive circuitry, said conductive circuitry being opaque with respect to said substrate at the wavelength of said light.

4,538,910

DUAL BEAM FOURIER SPECTROMETER

Walter M. Doyle, Laguna Beach, Calif., assignor to Laser Precision Corporation, Utica, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,346
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—346 **17 Claims**



1. A dual beam spectrometer comprising:

a radiation source propagating its beam from a single location;

an interferometer which receives the beam and which outputs a spectrally-scanned beam;

a beam interceptor which receives the output beam from the interferometer and divides its energy into two components;

a first detector adapted to receive one such energy component after it has illuminated a sample and convert it into an electronic signal;

a second detector adapted to receive the other such energy component without attenuation by a sample and convert it into an electronic signal; and

means for co-adding the signals generated by the two detectors to provide an electronic spectrometer output.

4,538,911

THREE-DIMENSIONAL INTERFEROMETRIC LENGTH-MEASURING APPARATUS

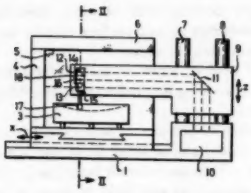
Erich Heynacher, and Reinhard Ludewig, both of Heidenheim, Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Jan. 13, 1983, Ser. No. 457,673

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1982, 3201007; Aug. 26, 1982, 3231719

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—358 **22 Claims**



1. A three-dimensional work-measuring instrument for measuring within a volume defined by a measurement range for each of three orthogonally related directional components, said instrument comprising a work holder and a housing carrying elements of a three-dimensional interferometric displacement-measuring system, said work holder and housing being movable with respect to each other, said elements producing orthogonally related interferometric measurement beams in the three component directions to be measured, a rigid three-dimensional reflecting body secured to the work holder, said body comprising three mirrors in mutually perpendicular relation, each of said mirrors being of area spanning the entire measurement range of a different two of the coordinate directions and oriented to serve as a reflector for a different one of the three interferometric measurement beams.

4,538,912

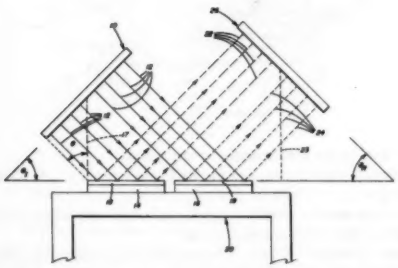
METHOD OF AND APPARATUS FOR INSPECTION OF COATINGS ON SURFACES

Hugh E. Shaw, Jr., Crystal City, Mo., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 29, 1982, Ser. No. 426,385

Int. Cl.³ G01N *21/21*

U.S. Cl. 356—366 **9 Claims**



1. A method for inspecting coatings on a substrate, comprising the steps of:

generating energy beams;

directing said beams toward both a sample coated substrate and at least one reference coated substrate to reflect beams therefrom as sample reflected beams and reference reflected beams respectively;

positioning an analyzer in the paths of both said sample reflected beams and said reference reflected beams to polarize said sample reflected beams and said reference reflected beams; and

comparing said polarized sample reflected beams and said polarized reference reflected beams to compare color variations on the sample coating and on the reference coating.

4,538,913

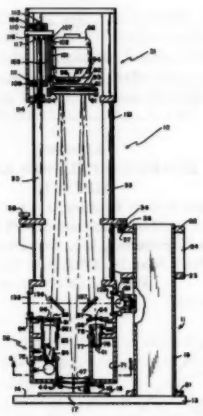
FLATNESS TESTING APPARATUS AND METHOD

Erik W. Anthon, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Continuation of Ser. No. 918,073, Jun. 22, 1978, abandoned, which is a continuation of Ser. No. 751,050, Dec. 15, 1976, abandoned. This application Nov. 29, 1979, Ser. No. 98,624

Int. Cl.³ G01B *11/30*

U.S. Cl. 356—371 **19 Claims**



1. In an apparatus for testing the flatness of the surface of a body of material, a source of light for producing a light beam, a first light transmitting reticle passing the light beam, a second light transmitting reticle passing the light beam, an objective lens adapted to be disposed adjacent the surface of an object, a lens in front of the source of light for imaging the source of light onto the objective lens, means for sensing light from said source, a lens in front of the means for sensing light for imaging the objective lens onto the means for sensing light, a mirror for receiving light from the source of light passing through the first reticle and reflecting the received light through the objective lens onto the surface of the body and receiving light reflected from the surface of the body and reflecting the light received from the surface of the body through the second reticle and onto the light sensing means, means for focusing the image from the first reticle onto the second reticle and means for causing relative movement of the image of the first reticle and the second reticle with respect to each other to modulate the light beam received by the means for sensing light to ascertain the flatness of the surface of the object.

4,538,914

TRANSFER APPARATUS FOR COMPENSATING FOR A TRANSFER ERROR

Minoru Yomoda, Kawasaki, and Izumi Tsukamoto, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1982, Ser. No. 450,349

Claims priority, application Japan, Dec. 23, 1981, 56-208468

Int. Cl.³ G03F *9/00*

U.S. Cl. 356—400 **11 Claims**

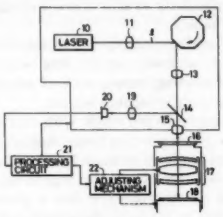
8. A transfer apparatus comprising:

optical means for optically relating a first object having a

plurality of first marks thereon to a second object having a plurality of second marks thereon, each of the plurality of second marks being related to one of the plurality of first marks thereby to define a plurality of sets of first and second marks;

detecting means for detecting the relationship between each set of first and second marks related by said optical means and for producing an output signal representing the detection;

discriminating means for discriminating at least one of a magnification error and a distortion error which occur at the time of relating the first and second objects with each other by said optical means, said discriminating means



performing the discrimination as aforesaid by discriminating an amount of deviation between the first and second marks in each set in accordance with the output signal produced by said detecting means and then discriminating at least one of the amount of the magnification error and the amount of the distortion error in accordance with the amount of deviation between the first and second marks in each set, said discriminating means producing an output signal representing the discrimination; and

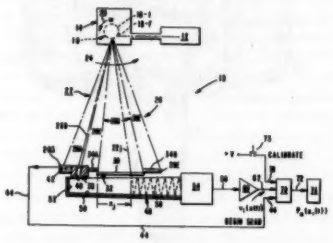
compensation means, responsive to the output signal produced by said discriminating means, for compensating for at least one of the magnification error and the distortion error.

4,538,915

WEB INSPECTION SYSTEM HAVING A PRODUCT CHARACTERISTIC SIGNAL NORMALIZING NETWORK

Mark E. Faulhaber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 23, 1981, Ser. No. 333,783
Int. Cl.³ G01N *21/32*
U.S. Cl. 356—431 **15 Claims**



1. In a product inspection system of the type having

a rotating multifaceted mirror adapted to direct a beam of radiation in a scan traversing the product to be inspected, each facet having a reflectivity characteristic associated therewith,

means operative during a predetermined portion of each scan for generating an electrical signal representative of the reflectivity characteristic of the mirror facet utilized during the scan,

a radiation collecting arrangement positioned with respect to the product being inspected for generating an electrical signal representative of a predetermined physical property thereof, the collection arrangement having an optical efficiency associated therewith,

wherein the improvement comprises:

a nonlogarithmic analog-to-digital converter responsive to the signal representative of the mirror reflectivity and to the signal representative of the product being inspected for generating a product signal that is independent of the reflectivity of the mirror facet utilized during the scan;

the converter being adapted to generate during a calibration scan a calibration signal representative of an acceptable product, the calibration signal having a component representative of the optical efficiency of the radiation collecting arrangement; and

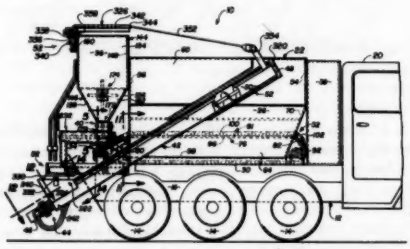
means operative during a subsequent analytical scan for scaling the calibration signal by a signal representative of the reflectivity of the mirror facet used during that subsequent scan and for applying the scaled calibration signal to the converter thereby to generate a product signal that is both independent of reflectivity of the mirror facet used during the analytical scan and normalized to account for the efficiency of the collecting arrangement.

4,538,916

MOTOR MOUNTING ARRANGEMENT ON A MIXING AUGER

Harold M. Zimmerman, R.D. 1, Wabash Rd., Ephrata, Pa. 17522

Filed Jun. 20, 1984, Ser. No. 622,376
Int. Cl.³ B01F *7/08*
U.S. Cl. 366—40 **12 Claims**



1. In a concrete production system including an elongated mixing trough having an inboard end and an opposite outboard discharge end, a mixing member disposed in said trough and mounted between said inboard and outboard ends, and a motor having a rotatable output shaft for driving said mixing member, said trough being pivotally supported at its inboard end for movement between operating and storage positions, said mixing member in said trough receiving fine and coarse aggregates, cement and water at said inboard end and causing mixing of the same into concrete while conveying them toward said outboard discharge end when said trough is in said operating position, an improved motor mounting arrangement which comprises:

(a) a mounting frame connected at one end to said inboard end of said mixing trough and at an opposite end mounting said motor with its output shaft extending toward said trough inboard end; and

(b) a coupler shaft assembly disposed between, and rotatably interconnecting, said motor and said trough inboard end for drivingly coupling said motor output shaft to said mixing member to transmit rotary motion thereto, said assembly including an annular element interposed be-

tween said motor and said trough inboard end and operable to substantially shield said motor from contact by water and other residue emanating from said mixing trough;

(c) said mounting frame including a cylindrical hollow central sleeve being aligned with said output shaft of said motor such that said output shaft extends therethrough and beyond said sleeve;

(d) said coupler shaft assembly including a central shaft extending between said trough inboard end and said central sleeve of said mounting frame, said central shaft at one end being interfitted with said mixing member and at an opposite end interfitted with said motor output shaft and transmitting rotary motion of the latter to said mixing member;

(e) said annular element of said coupler shaft assembly being disposed along and attached about said central shaft at said opposite end thereof adjacent said central sleeve of said mounting frame.

4,538,917

SCREW EXTRUDER

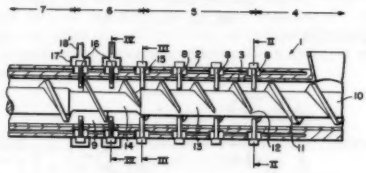
Engelbert G. Harms, Aachen, Fed. Rep. of Germany, assignor to Uniroyal Englebert Reifen GmbH, Aachen, Fed. Rep. of Germany

Continuation of Ser. No. 450,636, Dec. 17, 1982, abandoned. This application Jan. 9, 1985, Ser. No. 690,376

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1981, 3150719

Int. Cl.³ B01F *7/08*

U.S. Cl. 366—75 **2 Claims**



1. A screw extruder for mixing, homogenizing, and degassing highly viscous rubber mixtures and similarly acting thermoplastics, said extruder including: a housing having a cylindrical bore and passage means leading to an environment which is at a pressure of no greater than atmospheric pressure;

a screw conveyor which is rotatably fixed in said housing; said screw conveyor including a channel base as well as an entry zone for receiving material in a flow path of material, a mixing and homogenizing zone to homogenize the material mechanically as well as thermally for a temperature level reduction attained with good discharge efficiency, and a degassing zone; a screw conveyor chamber that is formed between said screw conveyor and the bore wall of said cylindrical bore of said housing, said screw conveyor chamber being in communication with said passage means of said housing; the improvement in combination therewith comprising:

pin-like members distributed over the periphery of the bore wall of said cylindrical bore of said housing in such a manner that said pin-like members are not totally blocking the flow while avoiding any significant shear flow due to splitting up the conveyed mass or material thereby to avoid disadvantages thereof and permitting temperature level reduction therewith, said pin-like members being adapted to extend radially inwardly from said housing into said screw conveyor chamber and being adapted at least in part for performance of multi-functions including mixing, homogenizing, viscosity reducing and equalization; and means for stagnation or obstruction before any degasification is said degassing zones and also for degassification in reduced pressure of degassing zone; and

interrupted lands, i.e., lands with gaps between successive portions thereof, on said screw conveyor in said mixing and homogenizing and said degassing zones thereof; with said pin-like members including first pin-like members which extend into said screw conveyor chamber and between said interrupted lands of said mixing and homogenizing zone, and second pin-like members which extend into said screw conveyor chamber and between said interrupted lands of said degassing zone; said second pin-like members themselves being provided with degassing channels therein respectively for effecting degassification in said degassing zones via said communication of said screw conveyor chamber with said passage means of said housing, said second pin-like members thus serving the multifunctions particularly in said screw extruder via multiple degassing channels;

at least some of said second pin-like members being disposed peripherally in at least one pin ring which is a suitable retaining or damming means, each of which is adapted to communicate with a vacuum source;

there being at least two pin rings, with said second pin-like members of a given pin ring being displaced as offset by a predetermined angle of rotation from said second pin-like members of the other of said pin rings to that material flow is divided by pin arrangement into a plurality of partial flows extending as far as to the screw conveyor channel base, thus assuring that trapped air or gas bubbles are exposed better over a considerably enlarged cross section and are released for the degassing;

said degassing zone of said screw conveyor further including a material retaining means and a reduced pressure zone; said pin-like members further including third pin-like members which form said material retaining means, said third pin-like members being disposed in at least one plane which extends transverse to the axis of said screw conveyor, each plane including numerous, closely adjacent third pin-like members.

4,538,918

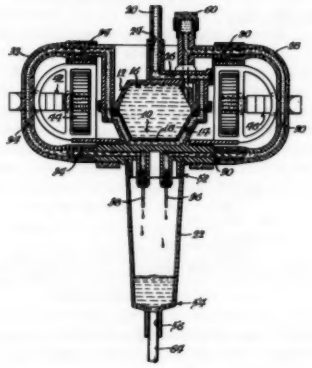
MEDICATION MIXING AND SEQUENTIAL ADMINISTRATION DEVICE

Herbert Mittleman, Deerfield, Ill., assignor to Trimedyne, Inc., Santa Ana, Calif.

Filed Sep. 19, 1983, Ser. No. 533,124

Int. Cl.³ B01F *15/04*

U.S. Cl. 366—160 **16 Claims**



1. A medication mixing device for use with a primary medication source, the device comprising:

(a) a housing defining a first confined space and a second

confined space separated by a movable partition, the first space being adapted to receive a secondary medication;

(b) a mixing cell mounted on the housing and having an outlet;

(c) an inlet on the housing for receiving primary medication from the primary medication source;

(d) a secondary medication fluid passageway in fluid communication with the first confined space and the cell;

(e) a first fluid passageway in fluid communication with the inlet and the second confined space;

(f) a second fluid passageway in fluid communication with the inlet, the first fluid passageway and the mixing cell such that a positive fluid pressure at the inlet generates a positive fluid pressure in the second confined space to drive the partition so as to displace secondary medication from the first confined space into the cell to mix with primary medication entering the cell through the second passageway.

4,538,919

APPARATUS FOR AUTOMATICALLY PRODUCING SOLUTIONS AT PREDETERMINED DOSAGES

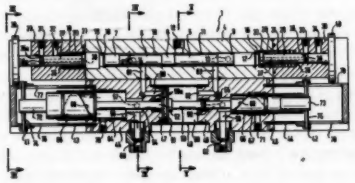
Franz Böhnensieker, Vom Stein Strass 27, 4834 Harsewinkel, Fed. Rep. of Germany

Filed Jun. 8, 1983, Ser. No. 502,341

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1982, 3221589

Int. Cl.³ G05D *11/00*; B01F *15/04*

U.S. Cl. 366—162 **22 Claims**



1. An apparatus for automatically producing solutions in predetermined dosages of a main fluid and a concentrate added to the main fluid, the apparatus comprising: a mixing container; a dosing device associated to the mixing container, the dosing device including means for discharging the main fluid into the mixing container in a predetermined amount and including a plunger reciprocating in a cylinder between two end positions and having two sides with control means for alternately supplying the main fluid under pressure into the cylinder to impinge one and the other side of the plunger wherein the main fluid causing a movement of the plunger in one direction remains in the cylinder and is dischargeable to the mixing container when the main fluid impinges the plunger to cause a movement of the plunger in the opposite direction, and means for discharging the concentrate to the mixing container and including at least one piston reciprocating in a further cylinder having inlet means for introducing the concentrate into the further cylinder and outlet means for discharging the concentrate contained in the further cylinder to the mixing container, the piston being coupled with the plunger for reciprocation in accordance with the latter, whereby upon discharge of the main fluid remained in the cylinder by the plunger a predetermined amount of concentrate is discharged by the piston to the mixing container.

4,538,920

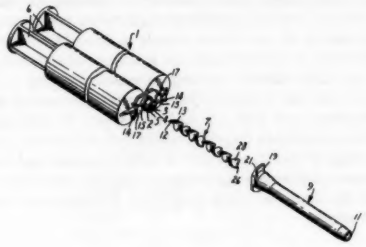
STATIC MIXING DEVICE

Gerald E. Drake, Knapp, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 3, 1983, Ser. No. 471,834

Int. Cl.³ B01F *15/02*

U.S. Cl. 366—177 **5 Claims**



1. A resin dispensing device, comprising:

(a) a multiple-barrelled syringe having an outlet through which can flow resin streams with a plane of contiguity between adjacent resin streams;

(b) an exit conduit comprising a generally cylindrical bore with an inlet end and an outlet end, said cylindrical bore being adapted to contain a static mixing element and prevent expulsion of said static mixing element from said outlet end of said conduit when polymerizable resin is forced therethrough;

(c) a static mixing element located in the bore of said exit conduit, said element comprising multiple counter-rotated auger-like mixing blades and an inlet end edge on the mixing blade proximate the inlet end of said conduit;

(d) means for detachably coupling said inlet end of said conduit to said syringe outlet; and

(e) means for orienting sid inlet end edge perpendicular to said plane of contiguity between said resin streams, said orienting means being in the form of one or more tangs which abut said static mixing element proximate said outlet end of said exit conduit.

4,538,921

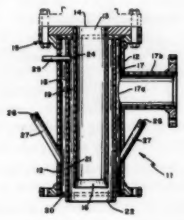
APPARATUS AND METHOD FOR SLURRYING SODA ASH

David K. Kennedy, Liverpool, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 25, 1983, Ser. No. 555,322

Int. Cl.³ B01F *5/04*

U.S. Cl. 366—178 **14 Claims**



14. In an improved nozzle for use in a soda ash slurrying system of the type in which soda ash particles are slurried with water or an aqueous sodium carbonate solution, and said slurry is thereafter injected into a slurry storage tank by means of said nozzle, said nozzle of the type which extends through an open-

ing in said tank, said improvement comprising a nozzle which comprises a housing, having at least one liquid passage and at least one soda ash particle passage therethrough, one opening of each of said liquid and soda ash particle passages for communication with the interior of a tank, and the other opening of said liquid passage for liquid communication with a source of water and/or an aqueous solution of sodium carbonate, and the other opening of said soda ash particle passage for communication with a source of said particles, the interior openings of said liquid and soda ash particle passages being positioned substantially along an axis of said nozzle in concentric relation such that water or aqueous soda ash solution and soda ash particles exiting said interior openings contact, forming a soda ash slurry, and said nozzle further comprising separating means for preventing said soda ash and said water or aqueous sodium carbonate solution from contacting before they exit the interior opening of said passages or at said openings, said separating means comprising a partitioning structure positioned between said openings and projecting from said openings exterior of said nozzle.

4,538,922

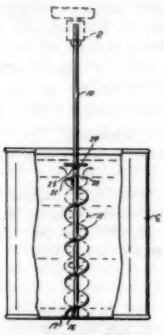
PORTABLE MIXING DEVICE

William H. Johnson, 1941 Karlin Dr., St. Louis, Mo. 63131

Filed Jul. 2, 1984, Ser. No. 627,115

Int. Cl.³ B01F *7/00, 7/24, 15/00*

U.S. Cl. 366—318 **6 Claims**



1. A mixer having a center shaft adapted to be vertically disposed in a receptacle of material to be mixed, a helicoidal flight of a plurality of coil units arranged about and extending outwardly from the center shaft, the lowermost coil unit at the bottom of the device having a substantially radial edge that extends outwardly from the shaft and that is horizontal, and having an outer corner rounded so as to reduce a tendency to cut into the receptacle, the upper end of the flight having a terminal edge that extends outwardly from the shaft and is substantially radial and with its outer corner rounded to avoid cutting into the receptacle, a baffle disk centered on the shaft and spaced above the upper terminal edge of the flight, the baffle disk and the flights providing an opening above the flight toward which the flight can direct the material being stirred and the baffle disk being adapted to deflect the said material outwardly from the shaft.

4,538,923

TEST CIRCUIT FOR WATCH LSI

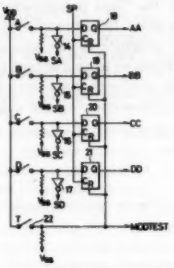
Yosuke Yoshida, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 421,916

Claims priority, application Japan, Sep. 24, 1981, 56-151162

Int. Cl.³ G04C *17/00, 19/00*

U.S. Cl. 368—70 **14 Claims**



1. In a test circuit for a timepiece IC having a switching circuit comprised of a plurality of switches and first memory means connected to said switches, a ROM connected to said first memory means for receiving the content thereof and connected to a plurality of operating mode terminals for receiving therefrom operating mode signals, and second memory means connected to the output terminals of said ROM for receiving therefrom data representative of operating mode signals and operative in response to an external signal applied thereto to apply operating mode signals to said operating mode terminals, the improvement comprising: a test terminal included in said switching circuit for receiving a mode test signal during use of the test circuit; first switching means connected between said second memory means and said operating mode terminals, the first switching means being opened when a mode test signal is applied to said test terminal and being closed in the absence of a mode test signal being applied to said test terminal; and second switching means connected between the output terminals of said switches and said operating mode terminals, the second switching means being closed when a mode test signal is applied to said test terminal and being opened in the absence of a mode test signal being applied to said test terminal; whereby mode operating signals are produced at said operating mode terminals corresponding to the switching states of said switches when a mode test signal appears on said test terminal.

4,538,924

CLOCK DEVICE

Shinichi Nakata, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 420,114, Sep. 20, 1982, abandoned, which is a continuation of Ser. No. 131,410, Mar. 18, 1980, abandoned. This application Jun. 29, 1984, Ser. No. 625,588

Claims priority, application Japan, Mar. 22, 1979, 54-32200

Int. Cl.³ G04B *23/02;* **G04C** *21/16*

U.S. Cl. 368—74 **10 Claims**

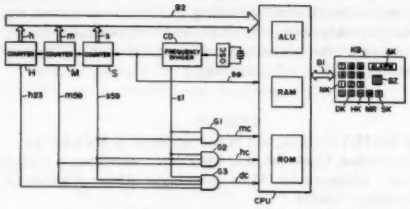
1. A clock device, comprising:

means for generating digital signals representative of running time data;

means for entering fixed time data into said device for indicating a fixed time;

means for determining a predetermined period of time in advance of the fixed time when the running time data and fixed time data will actually coincide and for generating a coincidence signal after the predetermined period of time

has elapsed in response to the advance determination of coincidence; and



means responsive to said coincidence signal for generating an alarm at the fixed time.

4,538,925

THERMAL POWER MEASURING DEVICE

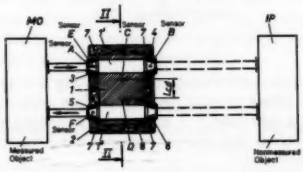
Miran Zgonik, Ljubljana, Yugoslavia, assignor to Avtomontaza Ljubljana n.sub.o. Tovarna Gospodarskih vozil, trgovina in servis motornih vozil, TOZD Tovarna grelnih naprav n.sub.o., Ljubljana, Yugoslavia

Filed Jan. 31, 1983, Ser. No. 462,390

Claims priority, application Yugoslavia, Mar. 18, 1982, 591/82

Int. Cl.³ G01K *17/06*

U.S. Cl. 374—39 **3 Claims**



1. A thermal power measuring device for measuring the thermal power and/or the quantity of heat in the total flow of a fluid medium through a thermal energy source or a thermal energy consumer means by a temperature gradient measurement, and the functioning of the thermal power measuring device is independent of the magnitude of the temperature difference in the medium, independent of fluctuations in the aggregate condition of the medium, such as particle content, and without requiring a knowledge of the specific heat of the medium, said thermal power measuring device comprising:

three coaxially mounted tube-shaped elements including an inner tube-shaped element, an intermediate tube-shaped element, and an outer tube-shaped element establishing a thermal path from the interior of the inner element to the exterior of the outer element, said inner element having a plurality of longitudinal ribs spaced along the interior surface thereof and said inner element having an inlet connection at one end thereof and an outlet connection at the other end thereof through which the medium flows and whose thermal power is measured, said outer element having a plurality of radial, ring-shaped ribs spaced along the exterior surface thereof such that the thermal power is assisted to dissipate radially outwardly across said three tube-shaped elements into the ambient environment;

a first temperature sensor located in said thermal path between the inner element and the intermediate element;

a second temperature sensor located in said thermal path between the intermediate element and the outer element, said sensors cooperating to produce a signal representative of said temperature gradient measurement; and

a measuring means for determining the measured thermal power based upon the temperatures measured by said first temperature sensor and said second temperature sensor.

4,538,926

TEMPERATURE INDICATING DEVICE

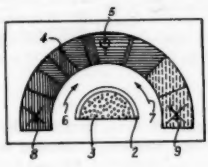
Michèle Chretien, 15 ter, Rue Nationale, La Queue lez Yvelines, France (78940)

Filed Feb. 17, 1983, Ser. No. 467,323

Claims priority, application France, Feb. 25, 1982, 82 03315

Int. Cl.³ G01K *11/12*

U.S. Cl. 374—150 **6 Claims**



1. A device for attachment to a bottle or the like which contains a liquid or other material, for purposes of indicating when the bottle is at a particular temperature most suitable for consumption of the contents of the bottle, said device comprising a thin support having an adhesive substance on a first surface thereof for attachment of said device to said bottle, and a temperature sensing element on the second surface, said temperature sensing element comprising a mixture of cholesteric crystals printed on said second surface, said mixture having a transition phase between the smectic and cholesteric phases of from 6°–15° C., said support further comprising colored areas adjacent to said sensing element, said colored area being of a succession of colors which successively correspond to the colors of the sensing element between 6° and 150° C., and wherein one of said colored areas is a marked area which identifies it as corresponding to the temperature which is most suitable for consumption, and a transparent layer covering at least said sensing element to insulate said sensing element from moisture, and wherein said transparent layer thermally insulates said sensing element from ambient temperature and has a thickness of between 150–600 microns, said device further comprising two arrows adjacent to said-colored areas on opposite sides of said marked area, each of said two arrows pointing towards said marked area in a manner so as to indicate to an observer whether the temperature being sensed by the device is too high or too low, and whether further cooling or heating is required.

4,538,927

ELECTRICAL TEMPERATURE SENSOR, PARTICULARLY FOR FEVER THERMOMETER USE

Claus Jochemczyk; Joachim Kwiatkowski, and Klaus Herrmann, all of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 12, 1984, Ser. No. 570,207

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 3300733

Int. Cl.³ G01K *7/00*

U.S. Cl. 374—163 **7 Claims**

1. Electrical temperature sensor, particularly fever thermometer, having

an electrical temperature sensor element **(15, 41)**;

two connecting wires **(16, 17, 35, 36)** extending from the sensor element;

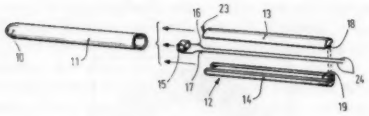
an elongated metallic holding sleeve **(11, 51)** closed at one end **(10, 52)** surrounding the sensor and retaining at least one of the connecting wires, in insulated relation, and guiding said at least one wire from the closed end to a second end; and

a positioning element (**12, 30, 40**), comprising two half-cylindrical structures, located interiorly of the sleeve, for positioning the sensor element therein,

wherein, in accordance with the invention, the sleeve (**11, 51**) comprises

cold-wrought or cold-drawn high strength material of such minor thickness that its heat capacity is at a minimum, consistent with required stiffness of the sleeve;

the positioning element (**12, 30, 40**) comprises a low-mass, closed-pore plastic foam; and



the sensor element (**15, 41**) is an essentially exposed, naked electrical thermal element, positioned within the closed end (**10, 52**) of the sleeve (**11, 51**) and adhesively retained therein;

one of the half-cylinder structures has a longitudinally positioned, springy structure (**18**) projecting from a flat surface thereof, and the other half-cylinder (**14**) is formed with a longitudinal groove (**19**) dimensioned and shaped to receive said springy structure (**18**); and

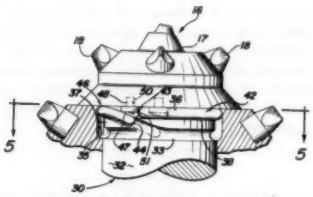
the connecting lines (**16, 17**) of the sensor (**15**) are located between said springy structure (**18**) and the longitudinal groove.

4,538,928

SCREW RING CONE RETENTION APPARATUS AND METHOD FOR ROCK BITS

Brian C. Muma, Huntington Beach, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jul. 9, 1984, Ser. No. 629,015
Int. Cl.³ F16C *43/04*; E21B *10/08*
U.S. Cl. 384—96 **20 Claims**



1. An apparatus to retain rotary cutter cones on journal bearings of an earth boring rock bit comprising:

a rock bit body forming a first pin end and a second cutter end, one or more journal bearings project from one or more legs extending from said bit body, said journal bearings being adjacent said second cutter end,

said rotary cutter cone forming cone bearing surfaces therein, said cone bearing surfaces complement bearing surfaces formed by said journal bearing projecting from said leg of said bit body,

complementary and registering annular grooves formed by said cone and said journal bearing, a tangential entry groove is formed in said journal, said entry groove extends from an end of said journal to said annular groove in said journal,

a split cone retention ring, said split cone retention ring having first and second ends, said ring is positioned in said annular groove in said cone prior to assembly of the cone onto the journal, and

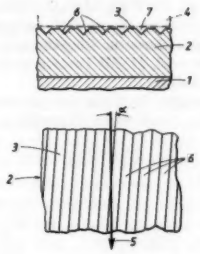
means retained within said cone to distort an end of said split ring to align said end of said split ring with said tangential entry groove in said journal, said ring is moved into said complementary and registering grooves in said cone and said journal to rotatively retain said cone onto said journal when said cone is simultaneously moved over said journal bearing and rotated about 360°.

4,538,929

HYDRODYNAMIC SLIDING SURFACE BEARING

Otto Ehrentraut, Gmunden, and Ulf Ederer, Altmünster, both of Austria, assignors to Miba Gleitlager Aktiengesellschaft, Laakirchen, Austria

Filed Sep. 12, 1983, Ser. No. 531,912
Claims priority, application Austria, Sep. 20, 1982, 3490/82
Int. Cl.³ F16C *32/06*
U.S. Cl. 384—120 **6 Claims**



1. In a hydrodynamic sliding surface bearing having a radially inwardly facing annular bearing surface adapted to be covered with a lubricant and to support a moving element movable relative to said bearing surface in a predetermined direction of movement,

the improvement which comprises forming said bearing surface with a plurality of grooves extending in, and axially spaced apart transversely to, said longitudinal direction and defining an angle not in excess of 5° with said direction, the grooves cooperating with said moving element so as to define passages adapted to receive said lubricant and to ensure the building up of a minimum hydrodynamic pressure of the lubricant, and the axial spacing of said grooves being less than 10 mm and not in excess of an upper limit

$$a_o = 200 + 0.5d + 0.006d^2$$

in micrometers, wherein d is the diameter of said bearing surface in millimeters.

4,538,930

ADAPTIVE PRINT HAMMER DAMPER

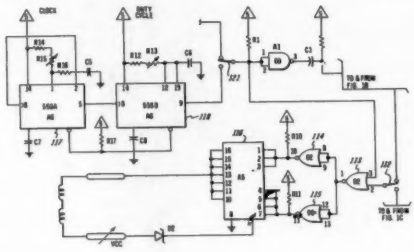
John C. Dunfield, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 24, 1984, Ser. No. 653,260
Int. Cl.³ B41J *9/42*
U.S. Cl. 400—144.2 **2 Claims**

1. In an impact printer, a hammer assembly comprising a hammer, a drive coil for driving the hammer against the printing element, and biasing means for returning the hammer to a backstop, a circuit for reducing the hammer velocity as the hammer position approaches the backstop, comprising:

a sensor responsive to the velocity of said hammer during said hammer's return to the backstop for producing an output which increases as a function of increased hammer velocity and increases as a function of decreased distance

between the hammer and the backstop, said sensor comprising a magnet, a core and a pickup coil, the magnet inducing lines of flux into said core, the core being made up of a fixed portion and a moveable portion, the portions being mechanically coupled to the hammer so that motion of the hammer results in a voltage output at the pick-up coil, said core being arranged so that the output voltage will be greatest for a given change of position when the hammer is closest to the backstop,



a comparator means responsive to the output of said sensor means for comparing said output to a threshold voltage, and for producing a binary signal whenever the hammer velocity exceed the predetermined velocity, and

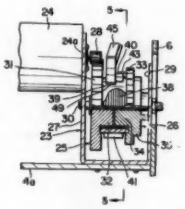
a driver responsive to said binary signal for generating a drive pulse and applying it to said drive coil in a forward direction to reduce the hammer velocity smoothly to zero as the hammer approaches the backstop, to increase print quality and decrease noise levels.

4,538,931

DRIVE MECHANISM INCLUDING A ONE-WAY SPRING CLUTCH FOR A TYPEWRITER

Yoshimitsu Nagashima, Kodaira, Japan, assignor to Silver Seiko Ltd., Tokyo, Japan

Filed Jan. 4, 1983, Ser. No. 455,592
Claims priority, application Japan, Jan. 18, 1982, 57-5023
Int. Cl.³ B41J *23/00*
U.S. Cl. 400—185 **7 Claims**



1. A drive mechanism for a typewriter having a member to be cyclically driven in one direction, comprising:

a first rotatable element;

a second rotatable element having a common axis of rotation with said first element and operatively coupled to said member;

an electric motor coupled to said first element and selectively energizable to rotate said first element in one direction for a cycle of operation of said member;

a clutch spring in continuous frictional engagement with said first and second elements such that said clutch spring only imparts rotation of said first element in said one direction relative to said second element and rotation of said second element in the opposite direction relative to said first element;

holding means having a first position in which said holding means positively holds said second element to a particular angular position about said axis and a second position in which said holding means releases said second element; and

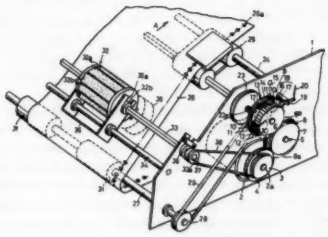
control means operable prior to and including initiation of energization of said motor to bring said holding means from said first to said second position and operable prior to and including completion of a cycle of rotation of said first element as well as said second element in said one direction to bring said holding means from said second to said first position to cause said second element as well as said first element to be positively held to a next particular angular position upon completion of the cycle of said rotation.

4,538,932

WIRE-DOT IMPACT TYPE PRINTER

Hideaki Takenoya, and Fumiyuki Mishima, both of Tokyo, Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Japan

Filed Jun. 22, 1984, Ser. No. 623,683
Claims priority, application Japan, Jun. 22, 1983, 58-94966[U]
Int. Cl.³ B41J *11/057, 23/34*
U.S. Cl. 400—185 **4 Claims**



1. A printer comprising a rotary platen provided on a periphery thereof a plurality of members saturated with different color inks; a printing head arranged opposite to said platen so as to cooperate with said platen to apply an ink of a specific color to a printing paper adapted to pass therebetween; first means for rotating said platen; second means for transporting said printing paper relative to said platen and said printing head; and drive means driven under a predetermined control to operate said first and second means through first and second transmission means respectively; wherein said second transmission means comprises

(a) switch means including a rotary member operatively connected to said drive means and rotated in one or the opposite direction in dependence upon the controlled drive movement of said drive means, said rotary member having gear teeth formed in a limited range on a periphery thereof, and

(b) clutch means provided between said switch means and said paper transporting means, said clutch means being operative to transmit the drive movement of said drive means to said paper transporting means when said gear teeth of said rotary member come to engage said clutch means while said rotary member is rotated in one direction, and being inoperative with respect to said paper transporting means when said rotary member is rotated in the opposite direction.

4,538,933

PAPER FEEDING APPARATUS IN A PRINTER

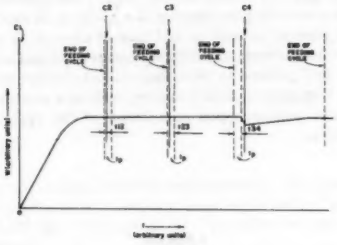
Mamoru Imaizumi, and Takashi Fujiwara, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 2, 1983, Ser. No. 529,697

Claims priority, application Japan, Sep. 10, 1982, 57-158286

Int. Cl.³ B41J *19/92;* **H02D** *5/16*

U.S. Cl. 400—582 **5 Claims**



1. A paper feeding apparatus in a printer, comprising:

a paper support member for supporting a sheet of paper for impression of characters thereon along a line of printing;

a drive mechanism operatively connected to said paper support member and including a drive motor to operate said paper support member for feeding said sheet of paper in a direction normal to said line of printing, said driving motor having an operating speed which can vary between an accelerating mode and a constant speed mode;

a drive circuit for energizing said drive motor; and

a control device operative to apply a control signal to said drive circuit to give a predetermined angle of rotation to said drive motor and thereby effect a paper feeding cycle of a predetermined distance upon each application of said control signal to said drive circuit,

said control device including control means comprising a means for adapting said control signal to progressively increase the operating speed of said drive motor up to a predetermined level when the application of said control signal takes place more than a predetermined time interval after termination of the last paper feeding cycle, and said control means including a means for adapting said control signal to cause said drive motor to maintain said predetermined level of operating speed throughout said predetermined angle of rotation when the application of the control signal takes place within said predetermined time interval.

4,538,934

AUTOMATIC LEAD ADVANCING MECHANISM FOR A MECHANICAL PENCIL

Engelbert Brunner, Zirndorf, Fed. Rep. of Germany, assignor to J. S. Staedtler KG, Nuremberg, Fed. Rep. of Germany

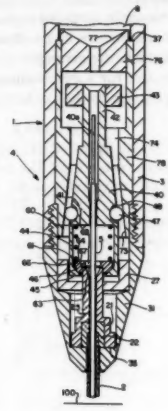
Filed Aug. 5, 1983, Ser. No. 520,634

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1982, 3229497; Apr. 21, 1983, 3314452

Int. Cl.³ B43K *21/22, 21/20*

U.S. Cl. 401—53 **18 Claims**

1. An automatic lead advancing device for a mechanical pencil comprising an axially movable lead guide tube, an axially movable clamping member having a central passageway there through for lead and having radially movable components to clamp the lead therein, a plurality of arms projecting axially from a face of said clamping member directed to a writing point of the pencil, inwardly directed stop claws on the ends of said axially projecting arms, a compression spring within said axial arms and having one end acting upon said face of said clamping member and another end acting against means operatively connected to said lead guide tube, and means between said compression spring and said stop claws for transmitting both radial and axial forces through said axially projecting arms and said stop claws to said clamping member



whereby the clamping member is in an unclamping position with respect to a lead therein when the pencil is in a non-writing position.

4,538,935

BALL AND SOCKET JOINT, PARTICULARLY FOR HEAVILY LOADED JOINT LINKAGES IN MOTOR VEHICLES

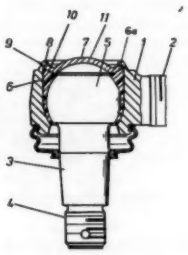
Joachim Burmeister, Bad Essen; Reinhard Buhl, Bohmte, and Paul Westphal, Lemförde, all of Fed. Rep. of Germany, assignors to Lemförder Metallwaren AG, Fed. Rep. of Germany

Filed Apr. 25, 1984, Ser. No. 603,581

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315718

Int. Cl.³ F16C *11/00*

U.S. Cl. 403—140 **4 Claims**



1. A ball and socket joint, comprising a ball stud having a spherical head portion, a socket member made of a material having limited elasticity embracing and extending completely around said head portion and having an upwardly and outwardly cambered top edge extending around said ball head, a casing accommodating and surrounding said socket, a cover of a sheet metal material overlying said ball head and sealingly closing said casing, said cover having an outer edge and an annular marginal edge portion cambered parallel to, overlying and substantially covering said cambered top edge of said socket member, said casing having an annular flange portion overlying said outer edge of said cover, said cover being biased against said socket member and having its outer edge engaging

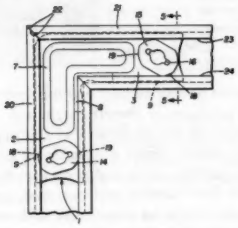
said casing flange portion, said outer edge and said engaging flange portion extending substantially perpendicularly to said cambered top edge and annular marginal edge portion.

4,538,936

FRAME CORNER

Horst J. Zeidl, Midland, Canada, assignor to TRW Automotive Products, Inc., Romeo, Mich.

Filed Dec. 8, 1983, Ser. No. 559,582
Int. Cl.³ F16B *12/50;* **G09F** *1/12*
U.S. Cl. 403—402 **19 Claims**



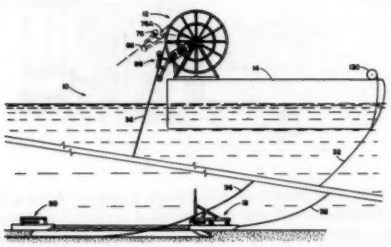
1. A joint comprising:
(a) two lengths of grooved metal sections;
(b) a connector having end portions insertable into a groove in each of said sections;
(c) a cam on each of said connector end portions; and
(d) means on each said cam for turning it laterally into locking engagement with first and second edges of its associated groove;
(e) each said cam being eccentric and having a first side which upon turning of said cam engages the first edge of said groove before a second side of said cam engages the second edge of said groove.

4,538,937

MARINE CONTINUOUS PIPE LAYING SYSTEM

Robert P. Lynch, Tulsa, Okla., assignor to Lyntech Corporation, Tulsa, Okla.

Division of Ser. No. 226,389, Jan. 19, 1981,. This application Jun. 8, 1983, Ser. No. 502,332
Int. Cl.³ B63B *35/04;* **F16L** *1/00*
U.S. Cl. 405—168 **6 Claims**



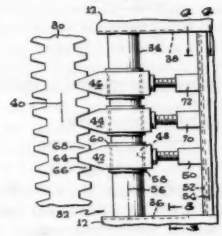
1. A marine pipe laying reel comprising a rotatable drum member adaptable for carrying multiple windings and multiple layers of pipe thereon, said drum being rotatably adapted to be carried by a marine vessel, a pipe straightener means pivotally carried by the rotational axis of the reel for straightening the pipe as it is paid off the reel, and wherein the pipe straightener means comprises an elongated frame pivotally carried by the rotational axis of the reel, the frame comprising at least two straightening rollers, one said roller being movable with respect to the other roller and including means for adjusting the relative position of said straightening rollers for varying the bending moment applied to the pipe.

4,538,938

ADJUSTABLE LOCKING CHOCK SYSTEM

Andrew Grzelka, and Davis R. Hodges, both of Gautier, Miss., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 26, 1983, Ser. No. 498,302
Int. Cl.³ E02B *17/06*
U.S. Cl. 405—198 **9 Claims**



1. A rack chock for a longitudinally extending rack comprising:
(a) a plurality of rack chock teeth movable individually and as a unit,
(b) each of said rack teeth having a clear bore,
(c) a support column positioned in a generally parallel relationship with the rack,
(d) an external thread on said support column,
(e) said clear bore of a rack chock tooth accepting said support column therethrough,
(f) at least one threaded locknut engaging said support column and rotatable thereon to position said rack chock tooth in general alignment with a rack tooth profile of the rack in an interdigitated but spaced apart relationship with the rack,
(g) jack means to position said generally aligned rack chock tooth into and away from an interdigitated contact and rigid locking engagement with said rack tooth profile
(h) first guide means for said support column during movement of said plurality of rack chock teeth as a unit and of an individual rack chock tooth, and
(i) second guide means for said jack means during movement of said support column and jack means in said positioning of a selected rack chock tooth in said general alignment and in said interdigitated contact and rigid locking engagement.

4,538,939

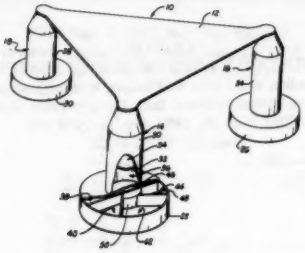
METHOD FOR BALLASTING A VESSEL

Jerry R. Johnson, Edmond, Okla., assignor to Transworld Drilling Company, Oklahoma City, Okla.

Filed Feb. 17, 1984, Ser. No. 581,453
Int. Cl.³ E02B *17/00*
U.S. Cl. 405—205 **19 Claims**

1. A method for ballasting a vessel having a plurality of ballast tanks, comprising the steps of:
(a) at least once selecting a subset of three ballast tanks from among said plurality of ballast tanks;
(b) selecting a ballast adjustment to be made to one tank of the subset in accordance with a preselected first criterion;
(c) assigning the ballast adjustment to a particular one of the

tanks of the subset in accordance with a preselected second criterion;



(d) repeating steps (b) and (c) until a preselected third criterion is met; and

(e) effecting the ballast adjustments.

4,538,940

ARRANGEMENT FOR FORCE TRANSFER BETWEEN LONGITUDINALLY STRESSED MEMBERS

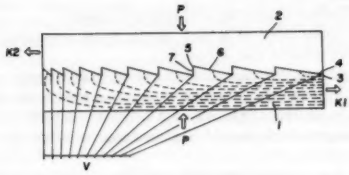
Erwin Isler, Rapperswil, Switzerland, assignor to H. Weidmann AG., Rapperswil, Switzerland

Filed May 11, 1983, Ser. No. 493,547

Claims priority, application Switzerland, May 14, 1982, 3023/82

Int. Cl.³ E21D *21/00*

U.S. Cl. 405—259 **7 Claims**



1. A structural arrangement for the transfer of a traction force (K1) applied to a first elongate element (1) and acting parallel to an interface surface (3) thereof, to a second elongate element (2) resting on the first element and having an interface surface (4) mating with that of the first element, said second element being held in place and being pushed against the first element with a lateral force (P) directed approximately vertically to the interface surfaces, the improvement comprising: a plurality of parallel, sawtooth shaped elevations of equal height (5, 6, 7) on both interface surfaces engaged with each other in a shape-locked manner, defining corresponding inclined flanks (6) of increasing length in the direction of application of the traction force on the first element and being essentially in full flank surface contact with each other; whereby, each tooth transmits nearly the same amount of force from said first element to said second element.

4,538,941

ROCK DUSTER APPARATUS

Gary H. Thorne, Colfax, W. Va., assignor to National Mine Service Company, Pittsburgh, Pa.

Filed Jul. 25, 1983, Ser. No. 517,062

Int. Cl.³ B65G *53/40*

U.S. Cl. 406—143 **9 Claims**

8. Apparatus for entraining particulate material in a stream of air comprising,

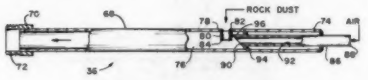
a first conduit having an inlet end and an outlet end with a passageway therethrough for directing a stream of air from said inlet end to said outlet end,

said first conduit having an opening into said passageway between said inlet and outlet ends,

a second conduit positioned in said first conduit opening and extending upwardly into said first conduit passageway,

a third conduit positioned in said first conduit passageway and extending through said first conduit inlet end to said second conduit,

means for supporting said third conduit coaxially in said first conduit passageway,



said third conduit having an inlet end for receiving a stream of air and a passageway therethrough, and

said third conduit having an outlet end abutting said second conduit at a contact point a preselected distance above said second conduit outlet end such that the flow of air through said third conduit and past said second conduit outlet induces a reduced pressure in said second conduit for continuously drawing particulate material into said first conduit opening and through said second conduit and into said first conduit for mixture with the stream of air and conveyance out of said first conduit outlet end.

4,538,942

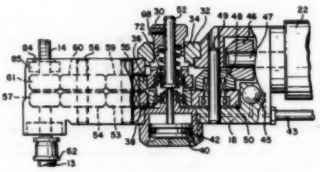
POSITIVE FEED DRILL WITH STOP CONTROL

Pierre G. Vindez, Redondo Beach, Calif., assignor to P.V. Tool, Inc, Gardena, Calif.

Filed Jun. 13, 1984, Ser. No. 620,354

Int. Cl.³ B23B *47/22*; B23Q *5/20*

U.S. Cl. 408—14 **2 Claims**



1. In a positive feed drill having a spindle drive gear train and a spindle feed gear train, coupled to the drive gear train by side teeth on respective drive and feed coupling gears mounted on a common shaft, a spring between said feed coupling gear and a housing for said gear trains to bias said feed coupling gear against said drive coupling gear, whereby said feed coupling gear is coupled to said drive coupling gear to feed said spindle forward as it drills, a positive stop for preventing said spindle from feeding further forward, thus causing said feed coupling gear to be driven by said spindle, and a slope on said side teeth on one side of each tooth for engaging said drive and coupling gears in order to allow said feed coupling gear to ratchet over said drive coupling gear when said spindle feed reaches said positive stop.

4,538,943

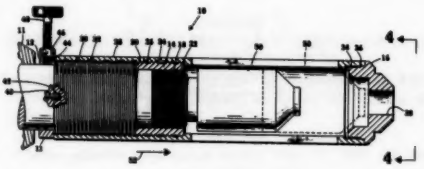
ADJUSTABLE NOSEPIECE FOR A DRILL MOTOR

James E. Clifton, El Cajon, and Ronald F. Carlson, San Diego, both of Calif., assignors to General Dynamics Corporation/-Convair Div., San Diego, Calif.

Continuation of Ser. No. 363,212, Mar. 29, 1982, abandoned. This application Aug. 20, 1984, Ser. No. 642,703

Int. Cl.³ B23B *45/14*

U.S. Cl. 408—14 **3 Claims**



1. An adapter nosepiece for a drill motor, said drill motor having an outer housing, a rotatable shaft which translates a pre-determined fixed distance relative to said outer housing, said shaft including a chuck for holding a drill bit on the distal end thereof comprising:

mating means for mating said nosepiece to said housing, said mating means provides for longitudinal positioning of said nosepiece along said housing and comprises engaging threads carried by said housing and said adapter nosepiece whereby each rotation of said adapter nosepiece relative to said housing translates said adapter nosepiece a known finite distance along said housing;

a locking means for locking said nosepiece in a selected location along said housing, said locking means comprises a collar moveably securable along said housing, said collar includes a key extending toward the distal end of said nosepiece; and

a key slot positioned along the end of said nosepiece adjacent the housing engaging end for receiving said key, when said collar is secured to said housing and said key engages said slot, said nosepiece is locked in position relative to said housing.

4,538,944

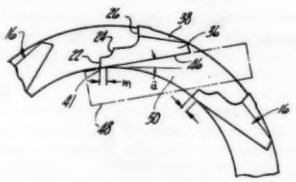
ANNULAR CUTTER

Everett D. Hougen, G-5072 Corunna Rd., Flint, Mich. 48504

Continuation-in-part of Ser. No. 303,917, Sep. 21, 1981, abandoned. This application Jul. 29, 1983, Ser. No. 518,637

Int. Cl.³ B23B *51/04*

U.S. Cl. 408—206 **9 Claims**



1. An annular cutter having a body provided with a generally cylindrical side wall, said side wall having a plurality of circumferentially spaced teeth around its lower end and a plurality of spiral flutes around its outer periphery extending upwardly from between the successive teeth, each tooth having at least one radially extending cutting edge, there being gullets extending radially outwardly from the inner periphery of the side wall to said flutes between successive teeth to facilitate the discharge of chips cut by said cutting edges radially outwardly and upwardly into said flutes, each gullet having a radially extending trailing face extending upwardly from the radially inner portion of each cutting edge, each tooth having a radially inner back off face inclining downwardly and radially outwardly and an outer back off face inclining downwardly and radially inwardly, said back off faces intersecting in a sharp crest defined by a line which extends circumferentially rearwardly from the front face of each tooth, said crest, when the cutter is rotated and advanced into the surface of a workpiece, initiates the cutting action by forming a V-shaped groove in said surface, the inner periphery of each tooth being relieved in a radially outward direction to provide a circumferentially extending radial clearance space between the inner periphery of the tooth and the central slug formed in the workpiece by the cutter, said clearance space extending rearwardly from a generally vertically extending line spaced rearwardly from the line of intersection of said inner periphery and the trailing face of each gullet, the inner peripheral surface of each tooth between said vertically extending line and said line of intersection forming a margin therebetween having a circumferential width of between 0.002" to 0.040", said margins forming a segments of a cylindrical surface concentric with the central axis of the cutter, the inner periphery of each tooth being relieved such that said clearance space is progressively wider radially in a circumferentially rearward direction and extends rearwardly on each tooth to the next successive rearward gullet.

4,538,945

APPARATUS FOR MACHINING A POLYGON PROFILE ON A WORKPIECE

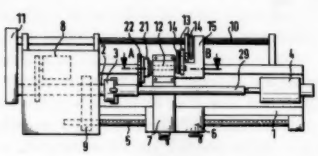
Paul Gödecke, and Otto Meichel, both of Neutraubling, Fed. Rep. of Germany, assignors to Krones Ag Hermann Kronseder Maschinenfabrik, Neutrabling, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 536,691

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1982, 3238442

Int. Cl.³ B23C *3/04, 3/24*

U.S. Cl. 409—157 **20 Claims**



1. An improved apparatus for machining a polygon profile on a workpiece including means for rotating the workpiece, a tool spindle and means for rotating the tool spindle in synchronism with the workpiece, the improvement comprising:

a tool having a circular circumference and a plurality of cutting edges at said circumference;

means for eccentrically mounting the tool on the tool spindle for oscillatory motion for intermittent engagement with the workpiece for machining a polygonal profile thereon; and

means for adjusting the eccentricity of the tool relative to the spindle for varying the profile.

4,538,946

HAND REPAIR TOOL FOR CURVED SURFACES

Joseph T. Bloch, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

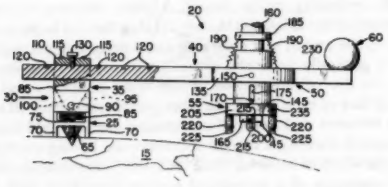
Filed Sep. 29, 1982, Ser. No. 426,358

Int. Cl.³ B23C *3/16;* B27C *5/10*

U.S. Cl. 409—179 **13 Claims**

1. A tool useful in the repair of damaged areas of a complex, compound curved surface, said tool comprising:

means for attaching the tool to said surface;
means carried by said attaching means capable of rotation with respect to said attaching means;
means carried by said rotatable means capable of pivoting with respect to said rotatable means;
an operating arm having one end carried by said pivotable means;
a fixed ring disposed at the other end of said arm;



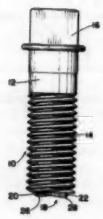
an inner ring pivotable connected to said fixed ring;
a mounting tube pivotably connected to said inner ring;
a guide means carried by the lower portion of said tube and being capable of contacting said surface for biasing said cutter towards a position that is substantially perpendicular to said surface;
a cutter assembly slidably carried by said tube, and
means for urging said cutter assembly towards said surface.

4,538,947

SET SCREW

Jack Burkholder, Rt. 2, Box 170AA, Eastland, Tex. 76448

Filed Nov. 25, 1983, Ser. No. 554,992
Int. Cl.³ F16B *35/00*
U.S. Cl. 411—393 **2 Claims**



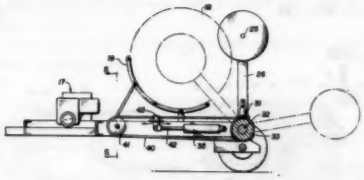
1. A set screw comprising shank means, cutting element means provided at one end of the shank means for a penetrating engagement with an object upon installation of the set screw, wherein the cutting element means extends axially outwardly from said one end of the shank means, and wherein the cutting element means comprises a pair of substantially identical oppositely disposed cutting segments of a substantially pie shaped configuration, a cutting edge provided for each cutting segment for an initial engagement with the object, the inner end of each segment being disposed at the axial center of the shank means and the outer periphery of each segment terminating radially inwardly of the outer periphery of the set screw, the outer surface of each segment being of a compound taper configuration having both circumferential and radial tapers across the outer face of each segment whereby the cutting edges engage the object prior to engagement thereof by the compound tapered surfaces.

4,538,948

HYDRAULIC ROUND BALE HANDLING SYSTEM

Michael A. Melton, Shelby, N.C., assignor to Melton Brothers Equipment, Inc., Shelby, N.C.

Filed May 9, 1983, Ser. No. 492,749
Int. Cl.³ A01D *87/12*; **B65H** *75/40*
U.S. Cl. 414—24.6 **12 Claims**



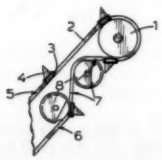
1. Ground supported handling and transport apparatus for generally cylindrically shaped round bales having substantially parallel ends, comprising in combination,
a single hydraulic lift ram with a reciprocation member,
grasping means comprising two spaced arms mounted to pivot on an axis located above the ground for grasping the ends of a bale and swinging it off the ground and upward about the axis,
stop means for limiting the bale movement about said axis after a swing about the axis of approximately 160°, and
means coupling the ram to said grasping means for controlling said swing of greater than 120° about said axis in response to reciprocation of said member comprising a flexible cable connected about a rotary drum member and moving the cable in opposite directions by said reciprocation member coupled for linear movement therewith, said rotary member being fixed for rotation about said axis with said grasping means thereby to swing said arms in opposite directions of rotation as the reciprocation member moves in opposite directions wherein said reciprocation member is coupled to two ends of said cable which has an intermediate portion of the cable wound about said rotary member and affixed thereto.

4,538,949

CONVEYOR FOR CONVEYING SILAGE OR THE LIKE MATERIAL

Cornelis H. Liet, and Fredericus Liet, both of Lösser, Netherlands, assignors to Trioliet-Mullos Silo Nederland B.V., Netherlands

Filed Jul. 25, 1983, Ser. No. 517,009
Claims priority, application Netherlands, Jul. 26, 1982, 8202987
Int. Cl.³ A01D *87/12*
U.S. Cl. 414—24.6 **16 Claims**



1. A conveyor means consisting of endless chains or the like, which are adapted to be driven and which are led over end rollers, while cross-bars extend between said chains, said cross-bars carrying teeth, the path which is followed by the cross-bars with the teeth including a conveying portion and an inactive portion which is positioned lower than the conveying portion, wherein the inactive portion of the path comprises a

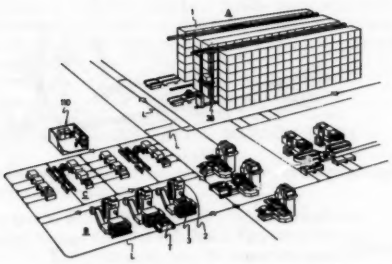
stretch, which extends partly towards the conveying portion and partly away from the conveying portion wherein teeth on adjacent cross-bars face each other along said stretch adapting the conveyor to release a fibrous bundle carried thereby, whereby the bundle carried by the conveying means is tensioned on the teeth when passing the end roller to which it is conveyed, and the tension is removed, and the bundle is released from the conveying means, when the bundle reaches said stretch of the inactive portion.

4,538,950

AUTOMATIC SYSTEM FOR CONVEYING WORKS IN A MACHINE SHOP

Tadataka Shiomi; Kouichi Nabika, both of Gifu, and Takashi Kawagoe, Shiga, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed May 21, 1982, Ser. No. 380,820
Claims priority, application Japan, May 25, 1981, 56-79588
Int. Cl.[3] B65H *5/04*
U.S. Cl. 414—222 **4 Claims**



1. An automated system for conveying a pallet on which a work is securely positioned between a pallet warehouse and a machine tool table, the pallet of the type having a body which includes upper and lower surfaces and side faces, the system including:

(1) a conveyor truck movable along a path laid on the ground between a loading station adjacent to the warehouse and an automatic work exchanging apparatus provided adjacent to the machine tool table, said conveyor truck including:

(a) a truck positioning device for positioning the truck with respect to the ground at a predetermined position on the path, the truck positioning device comprising:

(i) cone bodies secured on the ground at positions on the ground for the truck to be stopped,

(ii) an engaging device provided on the truck, the engaging device including cone plates attached to the lower end of a piston rod slidably engaged within a cylinder fixedly and vertically mounted on the truck, and

(iii) switch means for detecting upper limit and lower limit positions of the cone plates, said piston rod having connected thereto a disc-shaped dog which can engage with upper and lower limit switches of the switch means, said cone plates being engaged with the cone bodies by actuation of the engaging device cylinder when the truck stops, wherein the truck is set and positioned at a predetermined position with respect to the ground when the dog engages with the lower limit switch, and

(b) a pallet positioning device for positioning and supporting the pallet on the truck;

(2) an automatic work exchanging apparatus for transporting the pallet between the conveyor truck and the machine tool table, the automatic work exchanging apparatus having means for positioning the pallet on the automatic work exchanging apparatus by guiding a conveying surface provided on the undersurface and side faces of the pallet thereby controlling the position of the pallet when the pallet is transferred from the machine tool table to the conveyor truck; and

(3) pallet positioning means for positioning and fixing a pallet on the machine tool table, said pallet positioning means including:

(a) a reference surface on the lower surface of the pallet, and

(b) a reference surface on the machine tool table, wherein intimate contact of the pallet reference surface and the machine tool table reference surface precisely positions the pallet on the machine tool table.

2. An automated system for conveying a pallet on which a work is securely positioned between a pallet warehouse and a machine tool table, the pallet of the type having a body which includes upper and lower surfaces and side faces, the system including:

(1) a conveyor truck movable along a path laid on the ground between a loading station adjacent to the warehouse and an automatic work exchanging apparatus provided adjacent to the machine tool table, said conveyor truck including:

(a) a truck positioning device for positioning the truck with respect to the ground at a predetermined position on the path, and

(b) a pallet positioning device for positioning and supporting the pallet on the truck;

(2) an automatic work exchanging apparatus for transporting the pallet between the conveyor truck and the machine tool table, the automatic work exchanging apparatus comprising:

(a) positioning means for positioning the pallet on the automatic work exchanging apparatus by guiding a conveying surface provided on the undersurface and side faces of the pallet thereby controlling the position of the pallet when the pallet is transferred from the machine tool table to the conveyor truck,

(b) a four cornered truck laterally displaceable along circularly sectioned straight rails laid on the ground adjacent to the machine tool table,

(c) a platform vertically movable along supports positioned at the four corners and center of said truck, the platform being connected to piston rods of cylinders mounted at two positions on the truck, the vertical stroke of the platform being adjustable by positioning nut members on the corner supports so that the uppermost and lowermost positions of said platform can be defined by engagement of blocks fixed on the platform with said nut members,

(d) a pallet displacing device positioned on said platform, said pallet displacing device operating to transfer a pallet between the platform and the machine tool table, and p2 (e) driving means for driving the pallet displacing device; and

(3) pallet positioning means for positioning and fixing the pallet on the machine tool table, said pallet positioning means including:

(a) a reference surface of the lower surface of the pallet, and

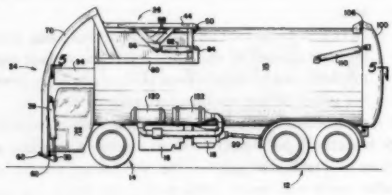
(b) a reference surface on the machine tool table, wherein intimate contact of the pallet reference surface and the machine tool table reference surface precisely positions the pallet on the machine tool table.

4,538,951

CHASSILESS VEHICLE AND FRONT REFUSE LOADER

Kenneth L. Yeazel, Tulsa, and Robert J. Forester, Broken Arrow, both of Okla., assignors to Crane Carrier Company, Tulsa, Okla.

Filed Sep. 6, 1983, Ser. No. 529,353
Int. Cl.³ B65F *3/04*
U.S. Cl. 414—407 **15 Claims**



9. A self-propelled wheeled load handling vehicle comprising;

a cylindrical load receiving tank directly supported upon a spaced driving wheel suspension system and a driven wheel suspension system;

a prime mover means and power transmission means attached to said tank between said suspension systems to interconnect said prime mover power to said driving wheels;

a fluid power source;

an operator's cab attached to a forward end of said tank, the top of said cab being substantially below the top of said tank, said cab having means to control the operation of said vehicle and said fluid power source;

said load receiving tank having a top front load receiving opening and a closure therefor, said closure pivotally supported to the top of said tank about an axis that is substantially transverse to the longitudinal forward/rearward axis of said tank, said pivot located at the rear of said opening;

first fluid power cylinder/piston means attached between said tank and said closure to pivot said closure from a horizontal closed position to a substantially vertical position;

a compacting packer piston reciprocable inside said tank from front to rear and vice-versa;

a telescopic fluid power expansible cylinder, a movable end of which is attached to said packer piston, and a fixed end of which is supported by a frame located forward of said tank above said operator's cab;

a tailgate of substantially the cross-sectional size of said tank and hingable connected to the rear end of said tank;

front loader means to temporarily attach with a pick-up load container positioned on the ground in front of said operator's cab, said loader means interconnected to said closure means to raise and dump same into said load receiving opening and return said container to its original position on the ground.

4,538,952

MOBILE BOAT DOLLY

Cleve D. Chase, 2024 Highway 20, Sedro Woolley, Wash. 98284

Filed Jul. 15, 1983, Ser. No. 513,779
Int. Cl.³ B60P *3/10*
U.S. Cl. 414—458 **18 Claims**

1. A straddle-type mobile boat dolly comprising, in combination:

(a) a horizontal frame member comprising spaced parallel port and starboard main frames and a forward converging frame portion;

(b) means for hitching said frame member to a towing mechanism;

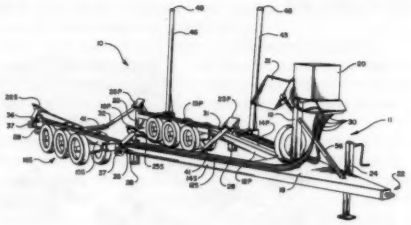
(c) running gear mounted on said frame member for supporting said dolly with freedom for over-land movement between points of dry storage and launching and/or hauling;

(d) fore and aft pairs of port and starboard lift pad assemblies each including a piston/cylinder combination fixedly mounted on said frame member along the port and starboard sides thereof and a vertically extendable and retractable lift pad pivotally secured thereto for engagement with the hull of a boat and for support of the boat during transport;

(e) actuating means mounted on said dolly and coupled to each of said piston and cylinder combinations for extending and retracting said lift pads;

(f) means defining fore and aft take-up/pay-out reels mounted on said frame member outboard of one of the port or starboard lift pad assemblies for each pair of fore and aft port and starboard lift pad assemblies;

(g) fore and aft first attachment means fixedly mounted on



said frame member outboard of the other of said port and starboard lift pad assemblies for each pair of fore and aft port and starboard lift pair assemblies; and,

(h) fore and aft flexible strap defining means each fixedly secured at one end to respective ones of said fore and aft reels, said fore and aft flexible strap defining means extending about the point of pivotal connection of said lift pads to said piston and cylinder combinations associated with each of said fore and aft port and starboard lift pad assemblies and spanning the space between said spaced parallel port and starboard main frames, said strap defining means having second attachment means secured to their free ends for releasable attachment to said first attachment means during support of a boat on said dolly with said fore and aft strap defining means extending beneath the keel of the boat and serving as tensioning means to prevent spreading of said port and starboard frame members and outward bending and/or spreading of said port and starboard fore and aft lift pad assemblies.

4,538,953

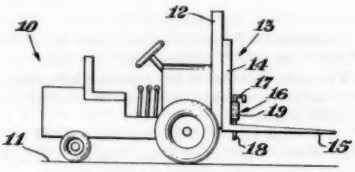
LOAD SECURING ASSEMBLY FOR A FORKLIFT TRUCK

Harold C. Abramson, Jr., Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 31, 1983, Ser. No. 547,507
Int. Cl.³ B66F *9/18*
U.S. Cl. 414—608 **2 Claims**

1. A forklift, the forklift being selectively positionable along a generally vertically extending mast, the forklift having a shank selectively positioned along said generally vertically extending mast, the forklift having affixed to the shank at least one generally horizontally extending dependent tine, said tine being disposed generally remote from said mast; a load engaging and disengaging means affixed to said shank with load engaging means adapted to engage a load on said forklift when said forklift is raised above a supporting surface, said load engaging means adapted to disengage said load when the said tine is disposed generally adjacent said supporting surface, including a member defining a generally vertically extending passageway affixed adjacent said shank, the load engaging

means having a generally J-shaped configuration, the load engaging means slideably disposed with the inset passageway, said load engaging means having a generally linear shank slideably disposed in the passageway and a toe portion extending generally away from said mast; the load engaging means being in an inverted position wherein said linear shank extends



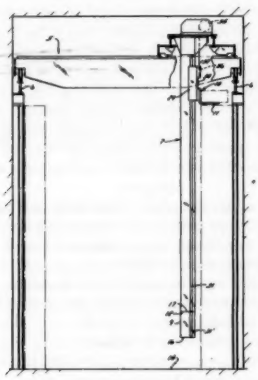
below the bottom of the tine when the tine is in a raised position; and when the tine is in a lowered position, the toe of the load engaging means being disposed upwardly relative to said tine; the toe of said load engaging means being adapted to engage a recess on a load when said tine assembly is in a raised position and disengage from the recess on a load when the tine is in a lowered position.

4,538,954

STACKER CRANE HAVING NARROW MAST STRUCTURE

Roger D. Luebke, Brown Deer, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed Dec. 1, 1983, Ser. No. 556,977
Int. Cl.³ B66C *19/00*
U.S. Cl. 414—633 **6 Claims**



1. A crane comprising a horizontally movable overhead trolley, an upright rigid mast having at an upper end thereof a connection with the trolley that confines it to rotation about its own axis relative to the trolley, the lower end of said rigid mast being spaced a substantial distance above a floor, an intermediate mast movable relative to said rigid mast down to and up from a lowered position in which a bottom end of the intermediate mast is at a substantially smaller distance above the floor, a carriage movable up and down relative to both of said masts and having means thereon for supporting a load, and a winch carried by the trolley and connected with the carriage for raising and lowering it, said crane being characterized by:

A. one of said masts having a lengthwise projecting pilot element fixed thereon

(1) which is of smaller cross-section than the other of said masts and

(2) which is telescopingly received in said other of the masts to guide the intermediate mast for motion between its said lowered position and a raised position in which the top end of the intermediate mast is contiguous to the lower end of the rigid mast;

B. each of said masts having a pair of guide rails extending vertically therealong, one at each of a pair of opposite sides thereof, the guide rails on the intermediate mast being vertically aligned with respective guide rails on the rigid mast;

C. biasing means reacting between the rigid mast and the intermediate mast to urge the latter toward its raised position;

D. guide means on said carriage cooperating with said guide rails on the masts to confine the carriage to vertical motion relative to the masts; and

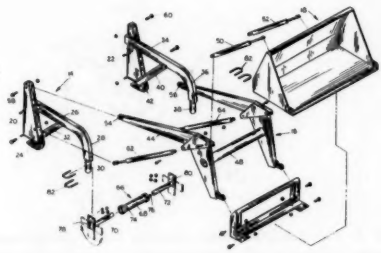
E. cooperating abutment means on the carriage and on the intermediate mast, engaged when the carriage is near the bottom of the intermediate mast, to constrain the intermediate mast to move up and down with the carriage between its raised and its lowered positions.

4,538,955

ADJUSTABLE TOWER FOR FRONT END TRACTOR LOADERS

Joseph W. Langenfeld, and Neal W. Westendorf, both of Onawa, Iowa, assignors to Westendorf Mfg. Co., Ltd., Onawa, Iowa

Filed Oct. 31, 1983, Ser. No. 546,902
Int. Cl.³ E02F *3/62*
U.S. Cl. 414—686 **3 Claims**



3. An adjustable tower for front end tractor loaders comprising,

first and second tower members having upper and lower ends,

said first and second tower members having connection means at their lower ends for connection to opposite sides of the tractor,

said first tower member having a first elongated frame member secured at its rearward end thereto and extending forwardly therefrom,

said first frame member having a downwardly extending forward end portion,

said second tower member having a second elongated frame member secured at its rearward end thereto and extending forwardly therefrom,

said second frame member having a downwardly extending forward end portion,

first and second booms pivotally secured at their rearward ends to the upper ends of said first and second tower members respectively, and extending forwardly therefrom,

first and second hydraulic cylinders connecting said booms and tower members for pivotally moving said booms with respect to said tower members,

the forward ends of said booms adapted to receive a materials-handling attachment thereon,

ball joints pivotally connecting said booms to said tower members to permit the forward ends of said frame members to be moved towards and away from each other,

and a length adjustable cross member secured to said downwardly extending forward end portions on said first and second frame members and extending therebetween for connection to the forward end of the tractor,

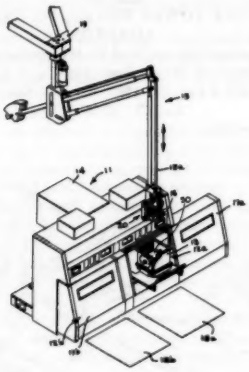
said cross member including selectively rotatable adjustment means at its opposite ends to permit said cross member to be selectively moved forwardly, rearwardly, upwardly and downwardly with respect to said forward end portions and tractor.

4,538,956

WORKPIECE GRIPPING AND MANIPULATING APPARATUS FOR LASER WELDING SYSTEMS AND THE LIKE

Ralph W. Kalkbrenner, Irwin, and Richard M. Kobuck, Delmont, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,262
Int. Cl.³ B66C *23/00*
U.S. Cl. 414—735 **9 Claims**



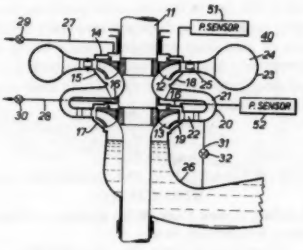
1. A workpiece handling assembly for gripping, manipulating and releasing a fixtured workpiece assembly for transport to and from and positioning in a workpiece welding station and the like by hoist means to minimize contamination of the welds produced therein, the workpiece being formed of an array of metal members and fixture plate members therefor assembled in a fixtured grid assembly wherein generally triangular protrusions project oppositely from the fixtured plate members and have precision convergent grip edges and precision apertured locating holes therein; said workpiece handling assembly comprising an inverted generally "U" shaped gripping and manipulating gripping device including a telescopically extensible horizontal crossbeam structure having depending support arms extending downwardly from opposite ends thereof, the lowermost ends of said arms having pivoted gripper jaw members journaled therein for rotary movement about a common horizontal axis including foot formations having confronting shaped contact surfaces to interfit and grip said convergent grip edges, rotatable adjusting screw means coupled with said crossbeam structures and one of said support arms for moving the latter toward and away from the other support arm to move said gripper jaw members to and from gripping relation with said grip edges of said triangular protrusions, and means for restraining at least one of said gripper jaw members at diametrically opposite angular positions about the pivot axis thereof to support the workpiece in either of two relatively inverted positions, and wherein said telescopically extensible crossbeam structure comprises a vertically spaced pair of parallel elongated horizontally disposed tube members fixed to one of said support arms and a pair of similarly spaced horizontal rods fixed to the other support arm and telescopically interfitted into said tube members, and said adjusting screw means includes a shaft journaled in one of the support arms having a hand knob for manipulation thereof and a screw thread portion threaded into nut means coupled to said crossbeam structure to effect extension and contraction of the crossbeam structure.

4,538,957

MULTI-STAGE HYDRAULIC MACHINE AND CONTROL METHOD FOR MULTI-STAGE HYDRAULIC MACHINE

Ichiro Yamagata, Yokohama, and Shinsaku Sato, Ebina, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 28, 1983, Ser. No. 536,733
Claims priority, application Japan, Sep. 28, 1982, 57-167706
Int. Cl.³ F01D *17/00*
U.S. Cl. 415—1 **6 Claims**



1. A control method for a multi-stage hydraulic machine which comprises a rotatable shaft; a plurality of runners fixed to said shaft and arranged from a highest-pressure stage; runner chambers in which are respectively housed said runners; a return channel connecting adjacent ones of said runner chambers with each other; movable wicket gates provided in at least the said highest-pressure stage and capable of moving between a position in which said movable wicket gates block said channel with one said runner chamber and a position in which said movable wicket gates open said channel; and a casing connected to said highest-pressure stage, said method comprising:

a first step of causing said movable wicket gates to block said channel;

a second step of feeding air to said runner chamber of the highest-pressure stage to lower a water level in said hydraulic machine to a draft tube positioned below said runner chamber of the lowest-pressure stage;

a third step of shifting a mode of idling operation of said shaft to one of a turbine generating and pumping operation,

said third step including:

a first process of exhausting air in said runner chamber of the highest-pressure stage, whereby said water level rises to said runner chamber of the lowest-pressure stage;

a second process of using the rotary centrifugal force of the lowest-pressure stage runner for feeding water from said draft tube to the return channel connected to said runner chamber of the lowest-pressure stage;

a third process of feeding a part of the water fed into said return channel back to said draft tube;

a fourth process of sequentially exhausting air from said runner chambers of stages below said highest-pressure stage, beginning with a stage immediately below said highest-pressure stage, except said lowest-pressure stage, after said runner chamber of said highest-pressure stage reaches an underwater shut-off state;

a fifth process of stopping said exhaustion of a part of the water from said return channel to said draft tube in said third process and, at the same time, exhausting air in said runner chamber of said lowest-pressure stage, when said runner

chambers of every stage except said lowest-pressure stage reach an underwater shut-off state; and

a sixth process of stopping exhaustion of the air from said runner chambers of each pressure stage when the pressure of said runner chamber of said highest-pressure stage reaches a predetermined value; and

a fourth step of opening said movable wicket gates.

5. A multi-stage hydraulic machine which comprises:

a rotatable shaft;

a plurality of runners fixed to said shaft and arranged from a highest-pressure stage to a lowest-pressure stage;

runner chambers which respectively house said runners;

a return channel connecting adjacent ones of said runner chambers with each other;

movable wicket gates provided at least in a channel of the highest-pressure stage and capable of moving between a position in which said movable wicket gates block said channel and a position in which said movable wicket goes open said channel;

a draft tube connected to the runner chamber of the lowest-pressure stage;

means for feeding compressed air into said runner chamber of said highest-pressure stage;

a communicating pipe, including a valve, connected with said runner chamber of each of said stages;

a water feeding pipe, including a valve, communicated between a portion of said return channel adjacent to said runner chamber of the lowest-pressure stage and said draft tube;

a pressure detecting means arranged at said runner chamber of each of said stages, respectively; and

means for controlling said valves of said communicating pipes and water feeding pipe in response to an output of said pressure detecting means;

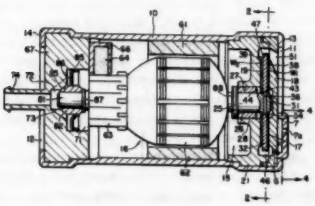
wherein said means for controlling said valves includes means for sequentially opening said valve of each said communicating pipe from a stage immediately below said highest-pressure stage to said lowest-pressure stage when the output of said pressure detecting means mounted on said highest-pressure stage exceeds a first predetemined value, means for closing said valve of the water feeding pipe when the output of said pressure detecting means mounted on the stage adjacent to said lowest-pressure stage exceeds a second predetermined value, and means for closing said valves of each said communicating pipe when the output of said pressure detecting means mounted on said highest-pressure stage exceeds a third predetermined value.

4,538,958

FUEL PUMP HAVING REGENERATIVE SECTION PROVIDED WITH VENT HOUSING FOR VOLTEX FLOW

Toshihiro Takei, Kariya; Yoshiyuki Hattori, Toyoake, and Shunsaku Ohnishi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 30, 1984, Ser. No. 575,389
Claims priority, application Japan, Jan. 31, 1983, 58-14462
Int. Cl.³ F04D *5/00*
U.S. Cl. 415—53 T **5 Claims**



1. A fuel pump comprising a regenerative pump section, a driving section connected to an impeller of the regenerative pump section, and a housing enclosing the regenerative pump section and the driving section, the fuel pump being provided with a vapor vent midway of a pump passage extending from a suction port of the regenerative pump section to a discharge port thereof, wherein

the vapor vent communicates with an outside of the fuel pump through a vent housing for a vortex flow, and

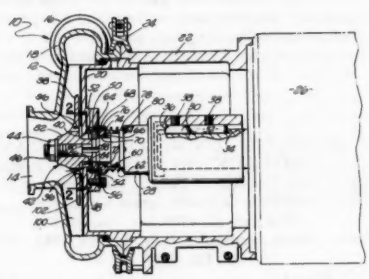
the vent housing has a vent chamber of a substantially circular shape, a tangential groove provided with one end communicating with the vent chamber in a tangential direction to the vent chamber and other end communicating with the vapor vent, and a discharge hole provided with one end communicating with a center portion of the vent chamber and other end communicating with the outside of the fuel pump.

4,538,959

CLEAN-IN-PLACE PUMP

Frank J. Cantor, Cypress, and Robert P. Horwitz, Costa Mesa, both of Calif., assignors to International Telephone & Telegraph Corp., New York, N.Y.

Filed Nov. 1, 1982, Ser. No. 438,076
Int. Cl.³ F04D *29/16*
U.S. Cl. 415—98 **7 Claims**



1. A liquid pump comprising:

an impeller mounted for rotation in a housing;

said housing having a wall embodying means forming a pocket in which particles in the fluid being pumped may become entrapped;

a drive shaft extending into said pocket;

said impeller having a hub fixed to said shaft;

an open axial slot formed in said shaft and extending into said pocket forming a flow path for fluid to flow to said pocket for producing turbulence within said pocket;

said impeller embodying a disc extending outwardly from said hub, said disc having a back facing said wall and a front, a plurality of impeller vanes on the front of said disc, a plurality of back vanes on the back of said disc, there being unrestricted flow communication between said impeller vanes and said back vanes;

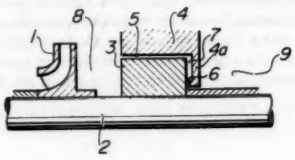
at least one axial passage extending through said disc and in flow communication with said pocket; and

said passage and back vanes cooperating to cause fluid to circulate through said pocket to remove therefrom particles dislodged from the surfaces forming said pocket by the turbulence created by fluid flowing through said slot.

4,538,960
AXIAL THRUST BALANCING DEVICE FOR PUMPS

Toshiki Iino, and Kunio Kamata, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 13, 1981, Ser. No. 234,178
Claims priority, application Japan, Feb. 18, 1980, 55-17816
Int. Cl.³ F01D 3/04
U.S. Cl. 415—104 2 Claims



1. An axial thrust balancing device for pumps, the thrust balancing device comprising:

a balancing drum secured to a shaft of impellers at a side of a last stage of said impellers for rotation therewith;

a stationary wall having a flange-like end wall portion extending inwardly along a low pressure sidewall of said balancing drum;

a small annular gap defined between said balancing drum and said stationary wall;

a small annular axial gap defined between the low pressure sidewall of said balancing drum and the end wall portion of the stationary wall at a small radius position;

a high pressure chamber defined by the last stage of said impellers, said stationary wall and the high pressure side wall of said balancing drum;

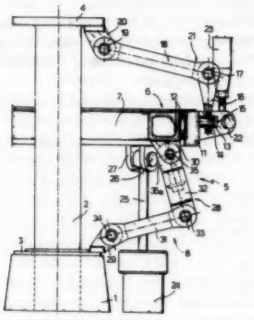
an intermediate pressure chamber defined between said annular gap and said axial gap by said flange-like end wall portion of said stationary wall and the low pressure sidewall of said balancing drum; and

a low pressure chamber defined at a rear side of said flange-like end wall portion of said stationary wall.

4,538,961
DEVICE FOR CONTROLLING CYCLIC AND COLLECTIVE PITCH OF A HELICOPTER ROTOR

Emilio Pariani, Cardano al Campo, Italy, assignor to Costruzioni Aeronautiche Giovanni Agusta S.p.A., Italy

Filed Jun. 13, 1983, Ser. No. 503,852
Claims priority, application Italy, Jun. 18, 1982, 67779 A/82
Int. Cl.³ B64C 27/74
U.S. Cl. 416—114 5 Claims



1. A cyclic and collective pitch control device for a helicopter rotor mounted on a drive shaft, said control device being supported by a fixed support and comprising:

an oscillating plate mounted around and spaced away from said drive shaft, said plate including a fixed inner ring and an outer ring rotatably mounted on said inner ring, said outer ring being adapted to rotate with said drive shaft;

a plurality of variable configuration supports uniformly distributed around said drive shaft and extending between said fixed support and the inner ring;

each of said configuration supports including a cylindrical pivot perpendicular to said drive shaft for connecting said configuration support to said plate, and forks engaging said pivot and being rotatable about a fork axis perpendicular to the axis of the associated pivot, at least one of said pivots being eccentric;

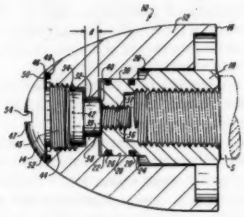
displacement means attached to said plate and adapted to oscillate said plate with respect to said shaft about axis substantially perpendicular thereto; and

rotor blade control means connected to said outer ring.

4,538,962
MARINE PROPELLER LOCK

Conrad L. McCain, 613 S. First St., Atwood, Kans. 67730

Filed Jan. 24, 1984, Ser. No. 573,485
Int. Cl.³ B63H 1/20
U.S. Cl. 416—146 R 9 Claims



1. A locking device for marine propellers to prevent their removal from a power drive shaft of a marine engine, the device comprising:

(a) retaining means mounted on said drive shaft for securing the propeller to the drive shaft, said retaining means having an elongated cylindrical outer surface arranged coaxially with said drive shaft;

(b) cover means slidably mounted over said retaining means, said cover means being generally elongated and sized to surround and loosely fit over said retaining means to restrict access to and prevent unauthorized removal of the retaining means and propeller, the outer surface of said cover means being formed in a generally continuous curve and having no more than one flat surface to prevent a person or object from gripping and forcibly turning the cover in order to apply a removal force to the retaining means;

(c) said cover means having a central axis and a first cylindrical recess arranged coaxially with said central axis and extending inwardly from one end, said recess being sized to loosely fit the retaining means to allow the cover means to rotate with respect to said retaining means;

(d) said cover means further including a second cylindrical recess arranged coaxially with said central axis and extending inwardly from the opposite end of said cover means from said first recess, the interior ends of said first and second recesses being spaced apart so as to form a partition therebetween;

(e) bolt means mounted through an aperture in said partition to secure said cover means to said retaining means, said bolt means having a head and an enlarged shank forming a shoulder which has a longitudinal dimension between the head and shoulder which is slightly greater than the thickness of said partition whereby when said bolt means is tightened to said retaining means the cover means will

remain free to turn without applying a turning force to the bolt means;

(f) cap means mounted in the end of the second recess of said cover means and sized to engagingly fit and close said second recess; and

(g) wrench means having a gripping area at one end and a plurality of socket ridges having a non-standard pattern formed at the opposite end, said head of the bolt means having a plurality of recessed grooves formed therein which corresponds to the pattern formed by the socket ridges of said wrench means whereby only the corresponding wrench means can be used to install or remove said bolt means.

4,538,963

IMPELLER FOR CROSS-FLOW FAN

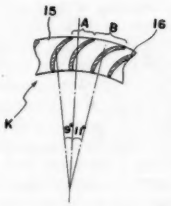
Takashi Sugio, Kusatsu; Makoto Obata, and Shotaro Ito, both of Shiga, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 3, 1984, Ser. No. 627,724

Claims priority, application Japan, Jul. 8, 1983, 58-125049

Int. Cl.³ F04D *29/66*

U.S. Cl. 416—203 **5 Claims**



1. An impeller for a cross-flow fan, comprising:

a plurality of successively adjacent, parallel confronting circular plate members, at least three in number, axially spaced along a rotational axis extending perpendicularly through the respective centers of said plate members; and

a plurality of axially coupled blade sections, each defined between a respective successively adjacent pair of said plate members and including a respective plurality of blades, substantially greater than five in number extending radially outwardly of said axis between, and mounted at opposite axial ends thereof to, said successively adjacent pair of plate members, the blades of each of said blade sections being circumferentially spaced at respective random pitch angles about said axis without periodicity;

no more than five of said blades of each of said blade sections being angularly located about said axis so as to be angularly aligned within 1° of any of the blades of an adjacent one of said blade sections.

4,538,964

MULTISTAGE RESONANT COMPRESSOR

Alec T. Brown, Ballston Lake, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jan. 4, 1984, Ser. No. 568,130

Int. Cl.³ F04B *25/00, 35/04;* **H02K** *33/02*

U.S. Cl. 417—267 **8 Claims**

1. A multistage reciprocating compressor comprising:

a casing with sidewalls and opposed end walls;

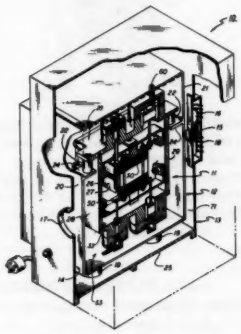
a linear motor having split stator sections affixed to opposing side walls of the casing to form a gap between the sections and a plunger assembly disposed within said gap and electrically coupled to the stator sections to reciprocally drive the plunger assembly in a reciprocating stroke manner between said opposed end walls;

a pair of spaced apart U-shaped flexure springs each having two legs and a body portion, each spring affixed at the legs to opposing side walls of the casing so that the body portion of the spring extends between the sidewalls;

said plunger assembly having one end attached to the body portion of one flexure spring and an opposite end attached to the body portion of the other flexure spring to suspend the plunger assembly between said flexure springs and support said plunger assembly during each reciprocating stroke;

a plurality of staged compression cylinders mounted in said end walls, each cylinder containing a close fitting piston;

connection means for driving each piston to compress the working fluid in the staged cylinders, said connecting means connected to each end of the plunger assembly and



operatively associated with each piston so that each piston reciprocates with said plunger assembly;

flow means for sequentially passing a working fluid through each of the staged compression cylinders, wherein the area of each piston in the sequence is smaller than the area of the preceding piston; and

means for balancing the compression forces acting on each end of the plunger assembly including positioning said compression cylinders in opposed end walls according to a relationship between the piston areas and the cylinder pressures whereby the natural frequency of the plunger assembly is substantially equal to the exciting frequency of the linear motor.

4,538,965

HYDROSTATIC RADIAL PISTON PUMP

Jörg Dantlgraber, Lohr-Sackenback, and Klaus Morio, Marktheidenfeld, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 325,843, Nov. 30, 1981, abandoned. This application Sep. 28, 1984, Ser. No. 655,879

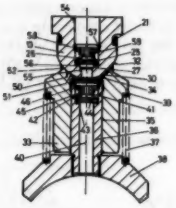
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046753

Int. Cl.³ F04B *1/04;* **F01B** *31/10*

U.S. Cl. 417—273 **3 Claims**

1. A hydrostatic radial piston pump, comprising a housing defining a suction chamber; an eccentric; a pressure valve member spaced from said eccentric and having a convex support; a movable structural unit arranged between said eccentric and said pressure valve member, said unit including a cylinder having a supporting face with a sealing edge spring-biased against said support of said pressure valve member, and a piston with a piston shoe spring-biased against said eccentric, said supporting face having an inner annular face portion, an additional outer annular face portion increasing said supporting face, and a circumferential groove formed between said face portions, said outer annular face portion of said supporting face also having at least one substantially radial groove communicating said circumferential groove with said suction chamber and performing only supporting function without

performing sealing function as well as being lubricated through said grooves; and a pressure spring arranged to bias said supporting face with a sealing edge of said cylinder against said support of said pressure valve member and to bias said piston shoe of said piston against said eccentric in force-transmitting manner, said spring having a predetermined force acting between said annular face portions or said supporting face upon said support of said pressure valve member, said annular face portions of said supporting face having a predetermined dimension increased by the provision of said additional outer annular face portion and selected so that a ratio of said force and said dimension does not exceed substantially 2.5 kg/cm^2.



4,538,966

OIL PUMP ASSEMBLY

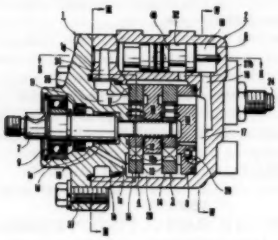
Masaya Nikaido, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

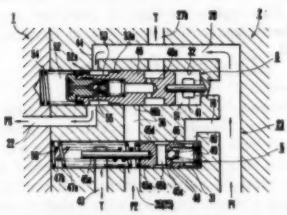
Filed Apr. 5, 1983, Ser. No. 482,321

Claims priority, application Japan, Apr. 19, 1982, 57-64989

Int. Cl.^{3} F04B *49/08;* F04C *2/00, 11/00*

U.S. Cl. 417—288 **3 Claims**





1. An oil pump assembly comprising a pair of first and second pump bodies coupled to each other, said first pump body defining a pump chamber exclusively of said second pump body, said chamber being open at the end adjacent the second pump body and defining a circular opening peripherally of which there is an annular groove and said second body providing a closure for the chamber defined by said first pump body and defining a cylindrical portion which fits into said circular opening in the first pump body against a sealing ring disposed in said groove, axially-spaced bearings supported in said second pump body, a drive shaft rotatably supported in said axially-spaced bearings, with an end extending into the pump chamber of the first pump body and an oil seal positioned about the shaft in the space between the axially-spaced bearings, said second pump body having a passage therein extending from the space between the oil seal and the inner one of the axially-spaced bearings into the pump chamber defined by the first pump body, first and second pumps mounted on said shaft on the portion of said shaft extending into said pump chamber and supported in concentric relation therein exclusively by said shaft, comprising a first pump cartridge embodying a rotor having a plurality of vanes and an encompassing cam ring within which it is received, a second cartridge comprised of a rotor having peripherally thereof vanes and an encompassing cam ring within which it is received, said cartridges being of smaller diameter than the pump chamber such that there is an annular space peripherally of the cartridges and means confining the cartridges in axially-spaced relation on said shaft within the housing, comprising a first rigid plate disposed about the shaft between the cartridges for axial movement thereon, said first rigid plate defining spaced, parallel surfaces engaged with the facing sides of said cartridges, an annular face peripherally of the cylindrical portion of said second pump body fitting within the circular opening of the first pump body in engagement with the outer side of the second cartridge and a pressure plate disposed within the first pump body defining an annular surface engaged with the outer side of the first cartridge, said pressure plate being supported in said first pump body independently of said shaft and said shaft, cartridges and pressure plate being removable from the pump chamber by separation of said second pump body from the first pump body and said first pump body containing a discharge port, a main passage connecting said first pump to said discharge port, said pumping chamber including a first pump discharge pressure chamber connected with the main passage, a directional control valve operatively mounted in said first pump chamber for selectively connecting said second pump to said main passage, an auxiliary passage providing communication between said second pump and said directional control valve and a flow control valve for selectively connecting the main passage and the pressure chamber located in the main passage between the first pump and the discharge port downstream of the direction control valve and serving as a second pump discharge pressure chamber.

4,538,967

BLOWER

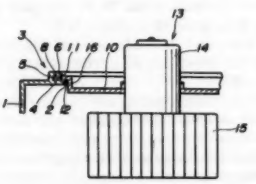
Kenji Furukawa, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1983, Ser. No. 486,510

Claims priority, application Japan, Apr. 30, 1982, 57-63959[U]

Int. Cl.^{3} F04B *17/00, 35/04*

U.S. Cl. 417—360 **5 Claims**



1. In a blower including a casing having a through hole formed in one end face thereof, said through hole extending axially of said casing and having an inner peripheral surface, a main body including a fan arranged to be received within said

casing through said through hole, and a motor drivingly coupled to said fan and extending axially through said through hole of the casing, said motor having a portion thereof arranged within said casing and the rest thereof outside said casing, a radially extending annular flange member fitted and rigidly secured on said motor and joined at an outer peripheral edge thereof to a portion of said one end face of said casing surrounding said through hole, said annular flange member having an outer peripheral surface, a first engaging half comprising an annular wall axially projected on said one end face and surrounding said through hole in concentricity therewith, a plurality of first engaging protuberances extending radially inwardly from said annular wall and circumferentially spaced from each other, each of said first engaging protuberances cooperating with said annular wall and a portion of said one end face surrounding said through hole to define an engaging recess therebetween, a second engaging half comprising a plurality of second engaging protuberances projecting radially outwardly from said annular flange member at an outer peripheral edge thereof and circumferentially spaced from each other, and retaining means for retaining said second engaging half on said first engaging half in predetermined positional relation thereto, wherein each of said second engaging protuberances of said second engaging half is fitted in said engaging recess corresponding thereto to couple said annular flange member to said casing,

the improvement comprising:

an annular ridge located on and secured to said inner peripheral surface of said through hole of said casing and extending about a whole circumference thereof, said annular ridge having a tip thereof facing radially inwardly of said through hole and having resiliency, said annular ridge having said radially inward tip disposed in urging contact with said outer peripheral surface of said annular flange member so that a resilient force of said annular ridge is applied to said outer peripheral surface of said annular flange member in a direction substantially at right angles with the axis of said through hole, to seal a clearance between said annular flange member and said casing; part of said annular wall of said first engaging half being projected more radially outward than the rest thereof and including at least one of said first engaging protuberances, at least one of said second engaging protuberances of said second engaging half corresponding to said at least one first engaging protuberance being correspondingly projected more radially outward than the other second engaging protuberances, said at least one second protuberance cooperating with said at least one first protuberance to locate said annular flange member in a predetermined circumferential position relative to said casing.

4,538,968

MOTOR DRIVEN FUEL PUMP

Yukio Kusakawa, Anjou, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 28, 1983, Ser. No. 470,542

Claims priority, application Japan, Mar. 1, 1982, 57-29300[U]

Int. Cl.³ F04B *17/00, 39/06*

U.S. Cl. 417—368 **8 Claims**

1. A motor driven fuel pump comprising:

a cylindrical motor housing;

a motor armature rotatably disposed in said motor housing;

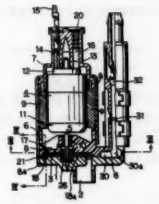
a pump housing secured to an end of said motor housing and defining a pump chamber having a radially positioned outer peripheral section;

a regenerative pump type impeller disposed in said pump chamber and rotatably journalled within said pump housing and drivingly connected to said motor armature, said impeller having an outer peripheral section cooperating with a radially outer peripheral section of the inner surface of said pump chamber to define a fuel passage extending circumferentially about said impeller;

a suction port formed in said pump housing and having an axis substantially parallel to the axis of said motor armature and communicated with said fuel passage adjacent one end thereof;

a discharge port formed in said pump housing and communicated with said fuel passage at the other end thereof and extending therefrom substantially tangentially thereto;

means defining an aperture extending through said pump housing for communicating said fuel passage with the inside of said motor housing, said aperture means including means defining an inlet opening portion at least a part



of which includes a surface angled with respect to the rotation of said impeller and to the direction of fuel flow so that a dynamic pressure component of the fuel pressure in said fuel passage is applied to said inlet means so that the dynamic pressure component forces a substantial amount of fuel through said aperture means; and

a discharge pipe connected to the downstream end of said discharge port and having an axis substantially parallel to the axis of said motor armature.

4,538,969

EXHAUST-GAS TURBOCHARGER WITH A BEARING SYSTEM LOCATED BETWEEN THE TURBINE AND THE COMPRESSOR

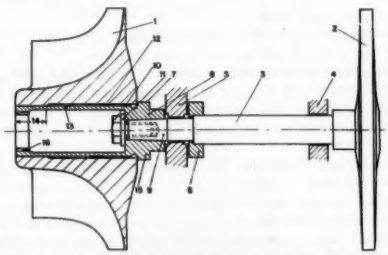
Hansruedi Ammann, Oberentfelden, and Hansulrich Hörler, Zürich, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 13, 1984, Ser. No. 671,060

Claims priority, application Switzerland, Aug. 18, 1981, 5324/81

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—407 **2 Claims**



1. An exhaust gas turbocharger with a turbine shaft supported by a plurality of bearing arrangements, comprising: a turbine wheel fixedly mounted on one end of said shaft and an impeller wheel releasably mounted at the other end of said shaft, said impeller wheel having a central bore, a front inlet side and a rear face, the other end of the turbine shaft having a conical shaft stub, an intermediate bushing for connecting said impeller wheel to said shaft, said intermediate bushing including a solid hub portion positioned adjacent said rear face and a thin-walled, cylindrical portion extending axially from said hub portion to said front inlet side through said central

bore, said hub portion having a conical bore which receives said conical shaft stub, an axially extending screw in the hub portion of the intermediate bushing for securing said intermediate bushing to said conical shaft stub, whereby said hub portion is positioned between the center of gravity of said impeller wheel and one of said plurality of bearing arrangements adjacent said impeller wheel; said impeller wheel being secured along a first exterior surface of the cylindrical portion in a compression fit at the front inlet side of the impeller wheel over a first length of the cylindrical portion which is short relative to total length of the cylindrical portion; a remaining length of the cylindrical portion being spaced apart from said central bore of the impeller wheel facing said remaining length of the cylindrical portion so as to define a ring shaped cylindrical gap.

4,538,970

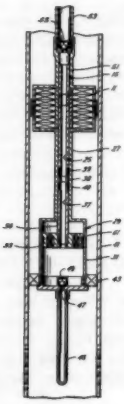
DOWNSTROKE LIFT PUMP FOR WELLS

Thomas A. Rabson, 4521 Ivanhoe, Houston, Tex. 77027

Filed Oct. 17, 1983, Ser. No. 542,849

Int. Cl.³ F04B *17/04, 21/02*

U.S. Cl. 417—417 **5 Claims**



1. Motor pump assembly including:

a reciprocating electric motor having a stator and a mover, and

a reciprocating pump having a barrel and a plunger and an inlet and an outlet,

said barrel being connected to said stator,

said mover being connected to said plunger,

said motor and pump being adapted to operate in a well with said mover and plunger reciprocating up and down and said inlet and outlet communicating with the volume of said barrel which volume is located at the underside of said plunger,

said inlet including inlet check valve means having an open position and a closed position, flow through said inlet check valve means into said volume being allowed when said inlet check valve means is in open position and prevented when said inlet check valve means is in closed position,

said outlet including outlet check valve means having an open position and a closed position, flow through said outlet check valve means from said volume being allowed when said outlet check valve means is in open position and prevented when said outlet check valve means is in closed position,

said motor providing means to reciprocate the plunger up and down in the barrel,

said pump providing means on the downstroke of the plunger to expel fluid from said volume of the pump barrel and through said outlet check valve means and elevate fluid above the assembly when the pump is suitably positioned in a well bore, and

said motor and pump providing means to move said plunger on the upstroke allowing fluid to enter said volume through said inlet check valve means,

said motor and pump including means comprising said outlet check valve means for maintaining said fluid above said assembly at rest during said upstroke,

said motor and stator including electromagnetic means cooperable with gravity to exert downward force on the plunger on the downstroke when the fluid is being elevated,

said electromagnetic means acting counter to gravity to exert upward force on the plunger on the upstroke to elevate the plunger while the fluid above the assembly remains at rest,

whereby the fluid above the assembly is lifted during but only during downstroke of the plunger.

4,538,971

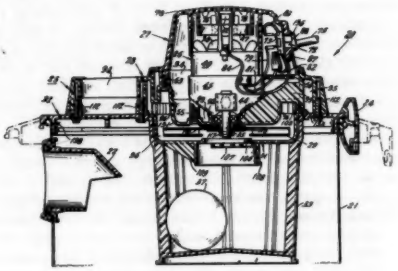
ASSEMBLY OF TANK LID AND FAN MEANS OF A WET/DRY VACUUM

Jonathan Miller, Haworth, N.J.; Rudolph W. Wacek, Montoursville, Pa.; Robert C. Berfield, Jersey Shore, Pa.; Ronald F. Meland, Muncy, Pa.; Robert L. Crevling, Jr., Williamsport, Pa., and Lonnie B. Lawson, Jr., Linden, Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Filed Jul. 18, 1983, Ser. No. 514,491

Int. Cl.³ F04B *17/00, 35/04*

U.S. Cl. 417—423 A **15 Claims**



1. A removable lid assembly for a by-pass type vacuum cleaner; said assembly including: a concave motor cover; an electric motor having an upper portion and a lower portion, said upper portion being disposed within said motor cover, said motor further having a vertical output shaft; a blower housing having the lower portion of said motor disposed therein with a portion of said shaft extending below said blower housing; a suction producing fan impeller secured to said portion of said shaft; a fan cover disposed below said blower housing and cooperating therewith to define an impeller chamber in which said impeller rotates, said fan cover having an intake opening defined therein; flow regulating vanes in said impeller chamber; a removable tank lid for supporting the motor cover, the motor, the blower housing and the fan cover, said blower housing and said tank lid at least partially defining an expansion chamber radially outward of said impeller chamber; said impeller when rotating drawing suction producing air upward through said intake opening in said fan cover and directing said air radially outward past said flow regulating vanes into said expansion chamber; said motor being sandwiched between said motor cover and said blower housing; first fastening means for securing said blower housing to said motor cover, said first fastening means being inserted at the bottom side of said blower housing; second fastening means for securing said fan

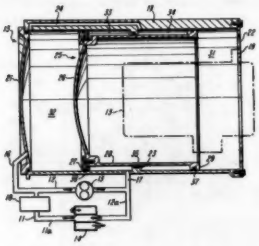
cover to said blower housing, said second fastening means being inserted at the bottom side of said fan cover; third fastening means for securing said lid to said cover, said third fastening means being inserted at the bottom side of said lid.

4,538,972

BOOTSTRAP RESERVOIR

Richmond A. Gooden, Kettering, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Dec. 30, 1983, Ser. No. 566,888
Int. Cl.³ F04B *11/00*
U.S. Cl. 417—540 **5 Claims**



1. In a system circulating a liquid coolant or the like under pump pressure, a bootstrap type accumulator-reservoir device of the sliding seal type, including a reservoir cylinder, a piston reciprocable in said cylinder, one end of said cylinder being closed and defining with said piston on one side thereof a first or low pressure chamber, the other end of said cylinder on the other side of said piston communicating with ambient surroundings, means in said cylinder intermediate the ends thereof defining a second or high pressure chamber in which fluid pressure acts on said piston in opposition to fluid pressure in said first chamber, said first chamber communicating with the circulating system on the suction side of the pump therein, said second chamber communicating with the circulating system on the discharge or pressure side of the pump therein, means in said cylinder intermediate said second chamber and the end of said cylinder communicating with ambient surroundings defining a third chamber, said means including a sliding seal between said second and third chambers, and means pressurizing said third chamber as said first chamber is pressurized, said third chamber positioning so that said second chamber can communicate with ambient suroundings through the said other end of said cylinder only through said third chamber.

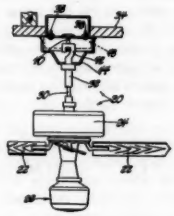
4,538,973

REMOTELY CONTROLLED CEILING FAN AND LIGHT CIRCUIT

Paul G. Angott, 457 Hurst, Troy, Mich. 48098, and Keith D. Jacob, 2321 S. Circle Dr., Ann Arbor, Mich. 48103

Filed Apr. 26, 1984, Ser. No. 604,153
Int. Cl.³ F04B *21/00*
U.S. Cl. 417—572 **21 Claims**

1. A fan assembly (20) for being mounted to a ceiling and suspension therefrom and comprising: support means adapted for connection to a ceiling; a fan blade means (22) rotatably supported by said support means; an electrical drive motor (24) supported by said support means for rotating said fan blade means; an electrical light means (26) supported by said support means for selectively providing illumination; receiver means (48) electrically connected respectively to said drive motor (24) and said light means (26) and adapted for electrical connection to the electrical power outlet for controlling the electrical power supply to said drive motor (24) and said light means (26) independently of one another in response to predetermined first and second radio signals; said receiver means (48) including electrical current regulator means (60, 61, 62, 63) for establishing the magnitude of electrical power supplied to said drive motor (24) and said light means (26) respectively over a predetermined range of power in response to said first and second radio signals respectively so that the employment of said first radio signal determines the speed of rotation of said drive motor (24) for said fan blade means (22) and the employment of said second radio signal determines the degree of illumination of said light means (26); said regulator means including memory means (61) for establishing the level of magnitude of power and for providing a predetermined reference level within said predetermined range of power supplied to said drive motor (24) and said light means (26) respectively,



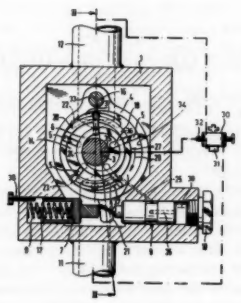
and reset means (65, 66) for resetting said memory means (61) to said reference level in response to the employment of said respective radio signals; characterized by said regulator means includii.g power level divider means (62) for dividing said predetermined range of power supplied to said drive motor (24) into a first plurality of stepped power levels and for dividing said predetermined range of power supplied to said light means (26) into a second plurality of stepped power levels of decreasing magnitude of power from stepped level to stepped level in said predetermined range of power supplied to said light means (26) so that the degree of change of illumination from said light means between adjacent stepped levels visually appears substantially equal.

4,538,974

VANE-TYPE OIL PUMP FOR AUTOMOTIVE VEHICLE

Bodo Stich, Wiesbaden; Ernst Hassler, Camberg, and Slawomir Adamowicz, Taunusstein, all of Fed. Rep. of Germany, assignors to Glyco Antriebstechnik GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 16, 1984, Ser. No. 590,483
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333647
Int. Cl.³ F01M *1/02;* F04C *2/344, 15/04;* F04B *1/08*
U.S. Cl. 418—26 **1 Claim**



1. In combination with an automotive-vehicle engine having

a lubricating system through which a liquid lubricant needs to be circulated and an output, a lubricating pump comprising:

a stator having an outer part forming intake and output ports and an inner part pivotal about a pivot axis on the outer part and having an inner surface defining a chamber centered on a stator axis extending between the ports, the ports opening axially into the chamber at locations diametrally opposite each other relative to the pivot axis and the chamber being closed radially outwardly relative to the axes by the inner part;

an adjustment tab projecting radially outwardly from the inner stator part generally diametrally opposite the pivot axis;

a rotor rotatable in the chamber about a rotor axis normally parallel to and offset from the stator axis and having an outer surface centered on the rotor axis, the rotor being formed with a plurality of angularly equispaced and radially extending guides open at the outer surface;

respective vanes of substantially the same radial length received in the guides and having radially outer ends riding on the inner stator surface and radially opposite inner ends;

at least one circular inner ring in the chamber and having an outer ring surface radially outwardly engaging the inner vane ends, the vanes angularly defining compartments axially closed by the stator outer part, radially outwardly closed by the stator inner part, and radially inwardly closed by the inner ring, whereby, when the stator axis is offset outward from the rotor axis and the rotor is rotated in a predetermined sense, the compartments move from the intake to the output port and decrease in volume at the output port and when the stator and rotor axes are coaxial there is no pumping action even when the rotor turns in the stator;

biasing means including a spring and pusher element braced between the tab and the outer stator part for urging the inner stator part pivotally outward about the pivot axis with a fixed force for separating the pivot and stator axes and thereby increasing the pump flow volume;

hydraulic biasing means pressurized from the output port and including a piston-and-cylinder assembly pressurizable to bear against the tab in one angular direction relative to the stator axis for urging the inner stator part pivotally inwardly for bringing the axes together and thereby decreasing the pump flow volume; and

abutment means connected to the inner stator part for permitting relative free movement of the inner stator part in the outer stator part between an intermediate position with the stator and rotor axes relatively close and an outer position with the stator and rotor axes relatively widely spaced, and for limiting movement between the intermediate position and an inner position with the stator and rotor axes coaxial, the abutment means including another spring engageable with the pusher element only when the inner stator part moves toward the inner position from the intermediate position.

4,538,975

SCROLL TYPE COMPRESSOR WITH LUBRICATING SYSTEM

Yasuhiro Tsukagoshi, Ota, Japan, assignor to Sanden Corporation, Japan

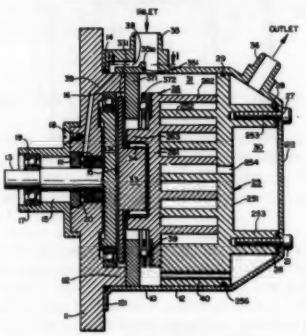
Filed Aug. 8, 1983, Ser. No. 521,256

Int. Cl.³ F04C *18/02, 29/02*

U.S. Cl. 418—55 **9 Claims**

1. In a scroll type compressor including a housing comprising a front end plate and a cup shaped casing, an inner chamber formed between an inner wall of said cup shaped casing and said front end plate, a fixed scroll fixedly disposed within said inner chamber and having a fixed scroll end plate from which a first wrap extends, an orbiting scroll disposed within said inner chamber having an orbiting scroll end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, said fixed scroll end plate dividing said inner chamber into a discharge chamber and a suction chamber, a driving mechanism operatively connected with said orbiting scroll to effect the orbital motion of said orbiting scroll while preventing the rotation of said orbiting scroll, and thus changing the volume of said fluid pockets due to the orbital motion of said orbiting scroll, the improvement comprising:

a fluid inlet port formed in said cup shaped casing and having an opening to said suction chamber for admitting a fluid to said suction chamber, the wall of said fluid inlet port having an aperture formed therethrough, said aperture formed above said fluid inlet port opening to said suction chamber, said aperture having an upper edge surface and a lower edge surface, a step portion fixed to



said lower edge surface of said aperture and projecting substantially perpendicular to said inner wall of said fluid inlet port and thus substantially perpendicular to the fluid flow through said inlet port for separating oil from the fluid flow before the fluid flow enters said inner chamber;

a first lubricant passageway formed in said housing having one end opening to said aperture formed in said inner wall of said fluid inlet port; and

a second lubricant passageway formed through said front end plate, said second lubricant passageway connecting said first lubricant passageway and a shaft seal cavity formed in said front end plate, so that lubricant separates from incoming fluid to be compressed on said step portion and passes therefrom to said seal cavity through said first and second lubricant passageways.

4,538,976

VANE COMPRESSOR HAVING SUCTION PORT AND DISCHARGE PORT LOCATED AT THE SAME AXIAL SIDE THEREOF

Tsunenori Shibuya, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,380

Claims priority, application Japan, Apr. 25, 1983, 58-61862[U]

Int. Cl.³ F04C *18/00, 29/00*

U.S. Cl. 418—133 **12 Claims**

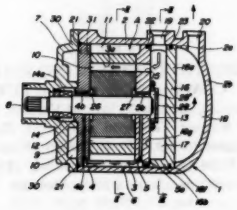
1. A vane compressor comprising:

a casing having a wall having an inner peripheral surface and an inner end face, and a suction port and a discharge port formed in said wall, both said suction port and discharge port being located at the same axial side of said casing corresponding to said inner end face;

a pump housing accomodated within said casing, said pump housing having an outer peripheral surface, at least one pump inlet and at least one pump outlet, said pump housing including an end wall having an outer peripheral surface thereof disposed in contact with said inner periph-

eral surface of said casing along a whole circumference thereof, said end wall of said pump hosing being in axially spaced and facing relation to said inner end face of said casing and cooperating therewith to define a space therebetween, said outer peripheral surface of said pump housing being radially spaced from said inner peripheral surface of said casing, said end wall of said pump housing having an inner end face;

said outer peripheral surface of said pump housing, said inner peripheral surface of said casing, and said inner end face of said end wall of said pump housing cooperating to define a first discharge pressure chamber in the form of an annulus therebetween, said at least one pump inlet of said pump housing being formed through said end wall of said pump housing, and said at least one pump outlet of said pump housing opening in said outer peripheral surface of said pump housing;



a partition member arranged within said casing, said partition member having an outer peripheral surface thereof disposed in contact with said inner peripheral surface of said casing and dividing said space into (i) a suction chamber defined between said end wall of said pump housing and said partition member, and (ii) a second discharge pressure chamber defined between said inner end face of said casing and said partition member, said suction chamber being located axially intermediately between said first and second discharge pressure chambers, and said at least one pump inlet of said pump housing opening into said suction chamber; and

communication passage means communicating said first discharge pressure chamber with said second discharge pressure chamber; said suction port of said casing opening in said inner peripheral surface of said casing and communicating with said suction chamber in a substantially direct manner.

4,538,977

ROLLER VANE PUMP WITH ANGULAR RANGES OF APPROXIMATE CONCENTRIC CIRCULAR PATHS FOR THE ROLLERS

Karl Ruhl, Niefern, and Ulrich Kemmner, Sachsenheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

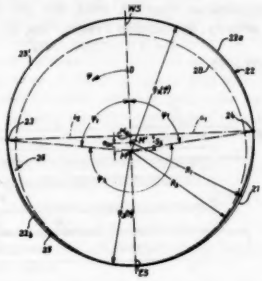
Continuation of Ser. No. 566,954, Dec. 28, 1983, abandoned, which is a continuation of Ser. No. 53,586, Jun. 29, 1979, abandoned. This application Jan. 14, 1985, Ser. No. 691,355

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835457

Int. Cl.³ F04C *2/00*

U.S. Cl. 418—150 **8 Claims**

1. A supply unit for fluids, in particular a fuel supply pump in the form of a roller cell or vane cell pump which is disposed in a common housing with a driving electromotor comprising, in combination, a driven rotor disc having a plurality of grooves, a plurality of individual pumping rollers disposed in said rotor disc grooves, a roller path formed by two ellipse halves having the same geometrical center Me disposed eccentrically to said disc for contact by said rollers, the major semi-axis of one ellipse half being identical to the minor semi-axis of the other ellipse half, whereby the ellipse shape about the apex points WS and ES of said ellipse halves approximate circular arcs of curvature with centers coinciding with said rotor disc, said roller path within an angular range of ±20° about the



narrowest and widest gap distances at the apex of said ellipical halves being substantially identical in each area with a concentric circular path about the center of said rotor path.

4,538,978

ROTARY PISTON FORMING MACHINE FOR CHOCOLATE

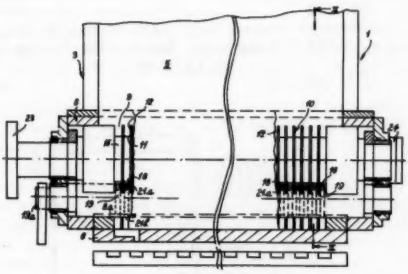
Renzo Cerboni, Milan, Italy, assignor to Carle & Montanari S.p.A., Milan, Italy

Filed Feb. 9, 1984, Ser. No. 578,561

Claims priority, application Italy, Apr. 14, 1983, 20589 A/83

Int. Cl.³ B29C *5/00*; A23G *3/18*

U.S. Cl. 425—206 **17 Claims**



1. A machine for use in forming chocolate and the like, comprising at least one hopper containing a product to be delivered, characterized in that it includes, located downstream of said hopper, a contoured metering and stirring cavity accommodating a rotatively driven rotor provided with spaced apart collars and rotary pistons, said rotor defining in said cavity a plurality of movable chambers on one side thereof in the form of chambers with annular adjacent metering segments, and on the other side thereof, a stirring chamber, a delivery valve located downwardly of each rotor and being mounted for oscillating movement, said delivery valve having a detent segement for movement into and from said movable chambers in the nature of a movable wall, said delivery valve having a delivery conduit with an intake port to said detent segment, and a passage depression adapted to permit, with said detent segment removed from the associated annular metering chamber, the unhindered passage of the related rotary piston above the respective delivery valve.

4,538,979

METHOD OF CONTROLLING A COMBUSTION FLAME

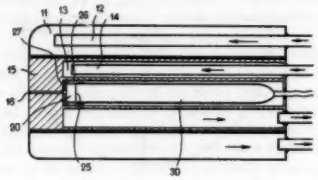
Claude Bertrand, Orleans, France, assignor to Centre National de la Recherche Scientifique (CNRS), Paris, France

Continuation of Ser. No. 304,639, Sep. 22, 1981, abandoned. This application Mar. 15, 1984, Ser. No. 587,880

Claims priority, application France, Sep. 25, 1980, 80 20591

Int. Cl.³ F23N *1/00*

U.S. Cl. 431—12 **5 Claims**



1. A method of optimally controlling the combustion of a mixture of pressurized components which provides a turbulent flame substantially exclusively by the acoustic noise level of the flame, comprising the steps of detecting the noise level across a frequency band between approximately 350 to 700 Hertz, converting said noise level to an acoustic pressure signal, generating a control signal representing the flow rate of one of said components, taking the ratio of said acoustic pressure signal to said control signal, using said ratio as a pilot signal, and adjusting the flow rate of one of said components to a level that adjusts the pilot signal to a maximum predetermined amplitude.

4,538,980

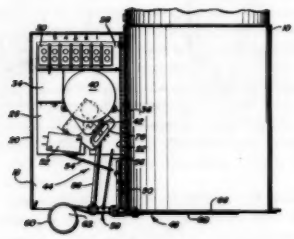
POSITIVE OPENING DAMPER FOR COMBUSTION APPLIANCE

Clifford L. Hoyme, P.O. Box 1485, Camrose, Alberta, Canada T4V 1X3

Continuation-in-part of Ser. No. 225,729, Jan. 15, 1981, Pat. No. 4,426,993. This application Jun. 21, 1983, Ser. No. 506,882

Int. Cl.³ F24C *3/00*

U.S. Cl. 431—20 **17 Claims**



17. In combination with a combustion air supply duct including an outlet end, a mount carried by one side of said outlet end, pivot means defining a pivot axis disposed outwardly of and adjacent said one side of said outlet end and swingably supported from said mount for lateral shifting outwardly away from and back toward said one end, a damper plate, said damper plate including an outwardly projecting lever arm from one end of which said damper plate is supported, a portion of said lever arm intermediate its opposite ends being supported for swinging oscillation about said axis with said lever arm disposed transverse to said axis and said damper plate being swingable with said lever arm into and out of position extending across and closing said outlet end, and a thermostat electrical circuit controllable motor operatively connected with the other end of said lever arm by lost motion connecting means for swinging said other end in an upstream direction relative to said outlet end responsive to actuation of said motor, said connecting means operatively connecting said motor to said other end of said lever arm by a lost motion connection therewith wherein full movement of the lever arm to the damper plate open position may lag relative to full actuation of said motor to open said damper plate, said connecting means including a rotor connected to the motor and having a slot formed therein, a link pivotally connected to the damper plate and having an end portion slidably mounted in the rotor slot, said slot and end portion of the link constituting said lost motion connection, and spring means engaging the end portion of the link within the rotor slot for yieldably biasing said lever arm to a position with said damper plate in the open position responsive to full actuation of said motor.

4,538,981

COMBUSTION CATALYZING SYSTEM FOR COMMERCIAL GRADE FUELS

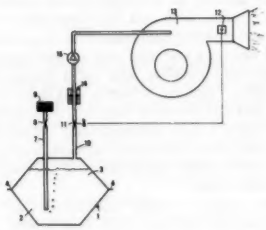
Andrea Venturini, deceased , late of Verona, Italy (by Antonio Venturini, Silvana Venturini née Salea, Rossella Venturini, heirs), assignor to SO. CO. EN. S.r.l., Ferrara, Italy

Filed Oct. 13, 1981, Ser. No. 311,116

Claims priority, application Italy, Oct. 14, 1980, 84963 A/80

Int. Cl.³ F23L *9/00, 7/00*

U.S. Cl. 431—190 **2 Claims**



1. In a combustion catalyzing system for commercial grade fuels, in which the combustion occurs in a burner or an engine, and which comprises a water reservoir, an air inlet conduit arranged to be immersed in the reservoir water to cause air to bubble through the water in the reservoir, a vapor entraining air outlet conduit extending from the reservoir upper portion to a combustion supporting air pipe leading to a combustion zone, a humidistat located at said combustion zone and arranged to detect the vapor content in the combustion supporting air entering the combustion zone, a flow control valve disposed on the said outlet conduit and operated by the said humidistat to control the vapor flow in the said outlet conduit, the improvement wherein it further comprises a flow-regulating oil-controlled device containing oil and having an adjustable oil content level and located on the said outlet conduit downstream of the said control valve, said oil-controlled device having means for adjusting said oil content level therein and means defining a passage through said oil for said vapor flow, the length of said passage depending upon said oil content level whereby the vapor-entraining air flowing through the said outlet conduit is controlled both by said oil-controlled device and by the said flow-control valve both in response to the oil content level in said oil-controlled device and in response to the humidity content in the said combustion supporting air respectively and is caused controllably to bubble through said oil in said flow regulating device in response to a suction effect of said burner or engine.

4,538,982

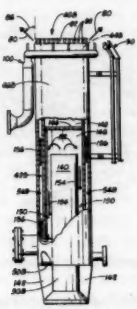
FLARE GAS COMBUSTION APPARATUS

Eugene C. McGill, Skiatook, and Robert L. Rawlings, Jenks, both of Okla., assignors to McGill Incorporated, Tulsa, Okla.

Filed Apr. 5, 1982, Ser. No. 365,588

Int. Cl.³ F23D *13/20*

U.S. Cl. 431—202 **12 Claims**



1. A flare gas combustion apparatus comprising:

a tubularly shaped flare housing having an upper end;

gas directing means for forming an orifice channel at the upper end of the flare housing and having an inner core surrounded by the orifice channel, the gas directing means comprising a liner member having first and second ends and supported within the flare housing, the orifice channel being the space between the inner wall of the flare housing and the outer wall of the liner member;

seal means for selectively preventing air and gas passage through the inner core of the gas directing means; and

a first flare conduit connected in fluid communication with the orifice channel so that a first flare gas portion passing through the first flare conduit is exhausted from the orifice channel at an exit port of the orifice channel at the upper end of the flare housing as a relatively thin layer of discharge gas so that combustion of the discharging first flare portion occurs as a perimeter zone discharge, the inner core of the liner member blocked to passage of the first flare gas portion; and

injector means for directing selected fluid into the liner member.

4,538,983

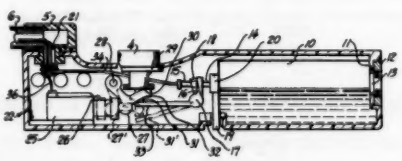
FOLDABLE SAFETY LIGHTER

Noel E. Zeller, 7 Brentwood Ave., White Plains, N.Y. 10605, and Bronislaw Zapolski, Princeton, N.J., assignors to Noel E. Zeller, Mount Vernon, N.Y.

Filed Oct. 11, 1983, Ser. No. 540,785

Int. Cl.³ F23Q *7/12*

U.S. Cl. 431—255 **11 Claims**



1. In a safety lighter of the type having a housing which contains a fuel container, fuel providing means for providing fuel from the fuel container to a flame point, igniting means including an insulated conductor for providing a spark at the flame point to ignite fuel provided from the fuel container to the flame point; and actuating means for actuating said fuel providing means and said igniting means,

the improvement comprising said housing having a recess formed on one side thereof; said actuating means being positioned in said recess; and an extension tube having one end for supporting said flame point and its other end mounted on a forward pivotal member of said housing for pivotal movement of said tube between a first position wherein said tube extends parallel to said housing over said recess so as to block access to said actuating means, and a second position wherein said tube extends away from said housing for allowing access to said actuating means and for providing a spark for a flame at said one end remote from said housing.

4,538,984

HANDY TORCH

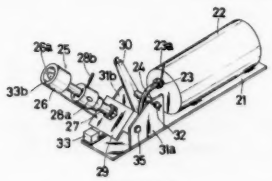
Katsuyuki Nakagawa, 1-8-2, Kobayashinishi, Taisho-ku, Osaka-shi, Osaka-fu, Japan

Filed Feb. 16, 1984, Ser. No. 580,721

Claims priority, application Japan, Jun. 8, 1983, 58-86298[U]; Jul. 19, 1983, 58-111077[U]

Int. Cl.³ F23Q *7/12*

U.S. Cl. 431—255 **8 Claims**



1. A handy torch for operation with a tank containing a fuel gas, the tank having a valve providing open and closed positions, said handy torch comprising:

a frame member for holding the tank;

a burner pivotally mounted on said frame member and including a nozzle and a mixing valve for mixing the fuel gas with air;

a conduit connecting said mixing valve with the tank valve;

an igniter having an electrode, positioned close to said nozzle, and an actuator;

a manually operative main control level pivotally mounted on said frame for movement between gas open, gas closed and ignition positions, said actuator being positioned to engage said main control lever only in said ignition position and said main control lever being operatively connected to the tank valve for movement of the valve between the open and close positions so that, by a single movement of main control lever, gas is released from the tank and ignited.

4,538,985

VAPORIZATION BURNER

Wolfgang Zwicker, Krailling, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Sep. 1, 1983, Ser. No. 528,654

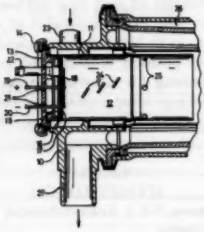
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1982, 3233319

Int. Cl.³ F23Q *7/08*

U.S. Cl. 431—262 **22 Claims**

1. A vaporization burner for liquid fuel heaters that is operable in any orientation, especially motor vehicle heaters, comprising a combustion chamber having combustion air intake means for introducing air into the combustion chamber in a turbulent manner, a vaporization body made of a fuel absorbent material, said vaporization body being connected to a means for supplying liquid fuel thereto and having an essen-

tially flat evaporation surface facing into said combustion chamber, for the vaporization of fuel supplied thereto for mixing with the combustion air, and an electric ignition device for igniting an initial flame, wherein the ignition device is a glow-type heating element which is disposed on the evaporation surface, wherein the vaporization body and the heating element are carried on a carrier that is mounted to the burner, said vaporization body and heating element being carried in such a manner that the vaporization body and heating element are replaceable as a unit.

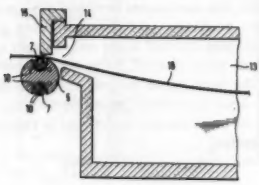


4,538,986

MEANS FOR SUPPORTING THE MATERIAL UNDER TREATMENT IN CONTINUOUS-ACTION HEAT TREATMENT FURNACES

Seppo I. Blomqvist, Tornio; Markku T. Saarela; Martti E. Huhtala, both of Kokkokangas; Raimo A. Niska, Tornio, and Hannu A. Vaittinen, Espoo, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jan. 18, 1984, Ser. No. 571,868
Claims priority, application Finland, Jan. 27, 1983, 830284
Int. Cl.³ F27D *3/00, 1/16;* F27B *9/28*
U.S. Cl. 432—236 **20 Claims**



1. A support for supporting material under treatment in a continuous action heat-treatment furnace having an entrance opening, comprising:

a first roller having at least two spaced recesses;

at least two other rollers on the periphery of said first roller, the diameter of said first roller being greater than the sum of the diameters of each of said other rollers, one of said other rollers being received in each of said recesses rotatable about their own individual axis and revolvable with said first roller about its axis thereof;

a support for said first roller independent of said furnace for supporting said rollers substantially outside said furnace at said entrance opening; and

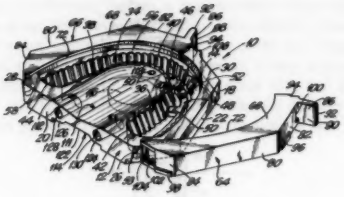
cooling means associated with each of said rollers.

4,538,987

DENTAL DIE TRAY ASSEMBLY

Bernard Weissman, New York, N.Y., assignor to Ipco Corporation, White Plains, N.Y.

Filed Sep. 22, 1983, Ser. No. 534,812
Int. Cl.³ A61C *19/00*
U.S. Cl. 433—60 **33 Claims**



1. A die tray assembly for production of a dental working model, comprising:

a tray body member having upper and lower surfaces, and a peripheral outer wall;

a hollow arcuate mold cavity extending entirely through said tray body member in an upwardly widening direction from said lower surface to said upper surface, said mold cavity being bounded by facing outer and inner cavity walls;

continuous teeth disposed on said facing cavity walls and extending into said mold cavity; and

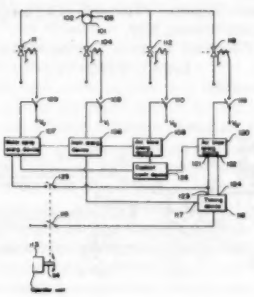
an arcuate rib supported as an island at a bottom of said mold cavity, said rib including identifying means for easily reinserting the model back into said mold cavity.

4,538,988

DENTAL APPARATUS WITH A NUMBER OF DENTAL INSTRUMENTS CONNECTED TO A COMMON CONTROL CIRCUIT AND A COMMON OPERATOR UNIT

Frank Henrichsen, No. 27 Peter Petersens Alle, Dragør, Denmark (2791); Flemming A. Hansen, No. 14 Mellemvej, Ballerup, Denmark (2750), and Kim Sørensen, No. 14 Fortunvaenget, Lyngby, Denmark (2800)

Division of Ser. No. 272,061, Jun. 9, 1981, Pat. No. 4,430,062.
This application Nov. 16, 1983, Ser. No. 552,319
Claims priority, application Denmark, Jun. 13, 1980, 2551/80
Int. Cl.³ A61C *1/10*
U.S. Cl. 433—84 **6 Claims**



1. A dental apparatus comprising at least one drilling instrument and an operator unit with a control member which is movable against spring action out of home position for energizing and controlling said drilling instrument, an instrument

energizing device connected between said drilling instrument and said operator unit, a water spraying device and an air blowing device provided on said drilling instrument, water and air supplies connected with said water spraying and air blowing devices, valve devices arranged between said water and air supplies and said water spraying and air blowing device, and water spray and air blow energizing devices connected to said valve devices and said instrument energizing device for producing a coolant spray during operation of the instrument, a selectively actuatable air blow energizing device with an associated valve device being provided at least for said air blowing device, said selectively actuatable air blow energizing device being connected to said operator unit for automatically supplying an opening signal to its associated valve device in response to the control member of said operator unit returning to said home position following a movement out of said position.

4,538,989

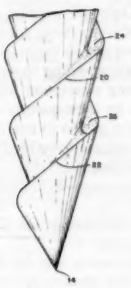
DENTAL REAMER

Jerry Apairo, Jr., and Derek E. Heath, both of Johnson City, Tenn., assignors to Dentsply International, Inc., York, Pa.

Continuation-in-part of Ser. No. 80,695, Oct. 1, 1979, abandoned. This application Sep. 16, 1980, Ser. No. 184,645

Int. Cl.³ A61C *5/02*

U.S. Cl. 433—102 **1 Claim**



1. A dental reamer comprising a shank tapered along at least part of its length and terminating at a point;

two oppositely disposed continuous helical flutes formed in said tapered shank defining two oppositely disposed continuous helical cutting edges, generally directed away from said point;

the helix angle of each of said flutes uniformly decreasing over the fluted length of said shank and the pitch of each of said helical flutes being constant over the fluted length of said shank;

each flute immediately adjacent said cutting edge being undercut to form a positive rake angle cutting edge; and the web defined between said at least two flutes immediately sloping away from said first and said second cutting edges so that there is virtually no outside circumferential land at said cutting edges.

4,538,990

METHOD OF DECREASING THE PERMEABILITY OF A DENTAL CAVITY

David H. Pashley, Augusta, Ga., assignor to Medical College of Ga. Research Institute, Inc., Augusta, Ga.

Filed Sep. 24, 1984, Ser. No. 653,321

Int. Cl.³ A61K *6/08*

U.S. Cl. 433—217 **9 Claims**

1. A method of decreasing the permeability of a prepared dental cavity surface, comprising the steps of:

(a) treating said cavity surface prior to receiving a restorative material with an effective amount of a neutral oxalate salt solution to form an acid resistant first surface; and

(b) applying to said first surface, at a predetermined amount of time after step (a) an effective amount of an acidic oxalate salt solution to form an acid resistant second surface, thereby forming an acid resistant liner on said dental cavity surface.

4,538,991

TARGET APPARATUS FOR WEAPON FIRE TRAINING

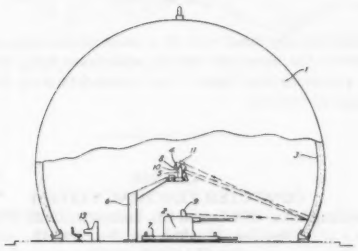
Anthony Simpson, Godalming; Stuart M. Peterkin, Effingham; Brian T. Brooksby, Redhill, and Harold J. Murray, Alton, all of England, assignors to Detras Training Aids Limited, Hampshire, England

Filed Apr. 27, 1981, Ser. No. 257,790

Claims priority, application United Kingdom, May 1, 1980, 8014486

Int. Cl.³ G09B *9/00*

U.S. Cl. 434—12 **33 Claims**



1. A target apparatus for use in the training of weapon direct fire, including a structure in which a weapon can be placed and which forms a screen of concave truncated spherical shape, a gantry located in said structure, at least one target image projector for projecting an aircraft target image onto said screen, universal mounting means supported by said gantry for mounting said at least one target image projector for universal movement substantially at the center of curvature of said spherical screen, whereby said target image projector is capable of moving the projected aircraft target image over substantially the whole of said screen, and at least one laser projector located adjacent to said target image projector, said mounting means also supporting said at least one laser projector for universal movement, said at least one laser projector being operable by a firing activation of the weapon to produce at any position over substantially the whole of the screen, by a projected laser of visible light, a visual indication on the screen of a least a final portion of the flight path of the simulated fired projectile or missile, corresponding to the position at which the weapon was aimed when fired, for a projectile or missile whose trajectory or flight path cannot be controllably varied after firing.

4,538,992

IMAGE PICK-UP ASSEMBLY FOR A VEHICLE TRAINING SIMULATOR

Anthony J. Summerfield, Horsham, England, assignor to The Singer Company, Binghamton, N.Y.

Filed May 17, 1984, Ser. No. 611,253

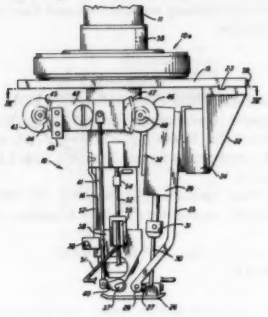
Claims priority, application United Kingdom, Jun. 6, 1983, 8315512

Int. Cl.³ G09B *9/08*

U.S. Cl. 434—38 **12 Claims**

1. An image pick-up assembly for a vehicle training simulator comprising a television camera and a terrain-following head unit to traverse a terrain model; the terrain-following head unit including an optical system to transmit an image of

the terrain to the television camera; said terrain-following head unit is coupled to the television camera by a gimbal joint to couple said terrain-following head unit to said television camera to permit universal movement; and means to lock the



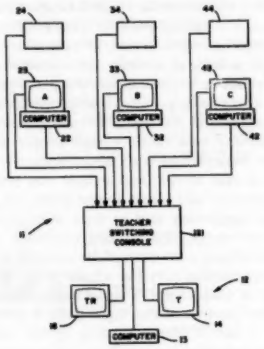
terrain-following head unit in a normal operating position relative to the television camera, said means being releasable by a predetermined force if the terrain-following head unit engages an obstacle.

4,538,993

COMPUTER TEACHING SYSTEM

Freda Krumholz, 4093 Legion Ct., Lafayette, Calif. 94549

Filed Feb. 27, 1984, Ser. No. 584,043
Int. Cl.[3] G09B *19/00*
U.S. Cl. 434—118 **11 Claims**



1. A computer teaching system for use with a plurality of separate and independently functioning student computer stations each having a computer and a display screen, and with a teacher station having an independently functioning teacher computer, a display screen and a receiver screen, comprising:

a teacher switching console connected to the respective display signal outputs of all computers and to the respective display signal inputs of all display and receiver screens, with switching means thereon for selectively connecting any computer display signal output to any student display screen and the teacher receiver screen, and

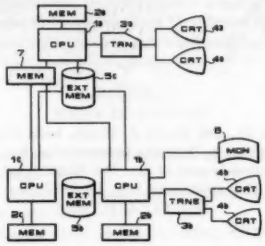
a student controller disposed one at each student station, and including switching means for selectively displaying the student computer generated display signal output upon said teacher receiving screen.

4,538,994

TRAINING SIMULATOR FOR TRAINING AN OPERATOR IN THE OPERATION OF AN ELECTRIC POWER SYSTEM

Mamoru Suzuki, Tokyo, and Hiromoto Tanaka, Hyogo, both of Japan, assignors to The Tokyo Electric Power Company Inc. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,350
Claims priority, application Japan, Nov. 17, 1982, 57-201515
Int. Cl.[3] G09B *9/00*
U.S. Cl. 434—219 **3 Claims**



1. A training simulator for training an operator in the operation of an electric power system comprising:

trainer input-output means having a plurality of pushbuttons respectively corresponding to a plurality of training items regarding training simulation for manually selecting one of said items to be subsequently executed;

trainee input-output means to enter proper data in response to simulated conditions provided through the execution of the selected training item; and

a first central processing unit connected to said trainer input-output means;

a second central processing unit connected to said trainee input-output means;

a third central processing unit for simulating various modes of operation of the electric power system;

a first external memory accessible by each of said central processing units;

a second external memory accessible by said second central processing unit;

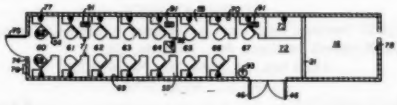
said central processing units providing means for executing a training review from the beginning of the training when a first command to restart the training is issued from the trainer input-output means and for executing another training item in response to a second command issued from the trainer input-output means designating conversion from the training review into another training item, during the execution of the training review.

4,538,995

PORTABLE COMPUTER CLASSROOM

Alan Fryer, P.O. Box 817, Ceres, Calif. 95307

Filed Jun. 15, 1984, Ser. No. 621,114
Int. Cl.[3] A47B *19/41*; B62D *39/00*
U.S. Cl. 434—432 **9 Claims**



1. A self-contained portable computer classroom comprising:

a trailer body mounted on wheels having connecting means at one end for connecting the body to a truck for towing by the truck;

at least one access door opening into the interior of said body, the interior of said body being open throughout but divided into a plurality of separate classroom areas and having a floor, a ceiling and longitudinally extending spaced inner side walls closed off at each end thereof by end walls;

at least two adjacent classroom areas being formed by a plurality of desk units, two of said desk units being provided in one area and two of said desk units being provided in an adjacent abutting area; and

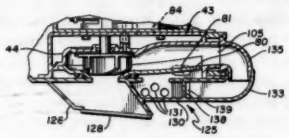
each of said units having an upper flat working surface and being wedge-shaped having a first straight line portion running along one of the inner side walls of said body in one of said areas and a second straight line portion extending both to the first straight line portion and to the plane of said inner wall, said two of said desk units disposed in one of said areas being disposed against opposite inner side walls of said body, the second straight line portions of said two of said desk units being spaced from each other thereby forming an aisle along the central longitudinal axis of said body.

4,538,996

JET PROPELLED BOAT

Thomas J. Inwood, Arden Hills, Minn., assignor to Surf-Jet Corporation, St. Paul, Minn.

Filed Feb. 8, 1983, Ser. No. 464,851
Int. Cl.³ B63H *11/08*
U.S. Cl. 440—38 **10 Claims**



4. A jet propelled boat having a hull in which is located a passenger compartment, and a transom at the stern of the boat, said boat having a propulsion unit mounted on the rear of the transom, said propulsion unit comprising:

an internal combustion engine having a vertical output shaft extending below said engine, said engine having an exhaust passage;

an impeller housing rigidly secured to said engine beneath the same with a water intake passage adjacent the bottom of the hull and a water discharge passage extending rearwardly from the transom at a vertical height approximately that of the bottom of the transom;

an impeller in said impeller housing mounted for rotation about a vertical axis and having a vertical drive shaft connected to the output shaft of the engine;

a housing secured to the underside of the propulsion unit, said housing having a water discharge compartment directed to the front of the boat and having oppositely disposed side openings, and an adjacent gas discharge compartment, said gas discharge compartment having side openings;

movable deflecting means for deflecting the water issuing from the water discharge passage into said water discharge compartment when it is desired to have the boat move rearwardly, the water passing laterally out of the oppositely disposed side openings; and

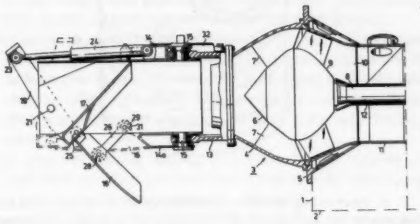
means connecting said gas discharge compartment to the exhaust passage of said engine so that the exhaust gas passes out through said side openings.

4,538,997

REVERSING MEANS IN WATER-JET PROPULSION UNITS

Kjell Haglund, Karlstad, Sweden

Filed Jan. 19, 1983, Ser. No. 459,252
Claims priority, application Sweden, Jan. 27, 1982, 8200417
Int. Cl.³ B63H *11/10*
U.S. Cl. 440—41 **6 Claims**



1. A reversing means in a marine water-jet propulsion unit including a pump having an outlet side connected to a nozzle tube for forming and directing a driving water jet, said reversing means comprising:

an opening in a wall of said tube;

an inner flap and an outer flap normally arranged for closing said opening from the inside and outside, respectively, of said tube, said inner flap being pivotable between said closed position in said opening and an open position in which said inner flap is swung inwardly into said tube to expose said opening and to substantially block the path of flow of water through said tube, and said outer flap being pivotable between said closed position in said opening and an open position in which said outer flap projects outwardly, and in an upstream direction relative to the direction of flow of the water through said tube, to expose said opening;

and a common operating means connected to said inner and outer flaps for pivoting them simultaneously between their said closed, and open, positions,

each of said flaps being pivotable about its downstream end, said inner flap downstream end being rigidly connected to an operating lever which forms an angle with the inner flap and which is pivotable about an axis which is stationary relative to the tube and which extends at right angles to the longitudinal direction of the tube, in a manner such that the inner flap can be swung, by swinging the operating lever about said axis, between its said closed and open positions;

said downstream end of the outer flap being pivotally connected to the downstream end of the inner flap about a pivot axis extending parallel to the pivot axis of the operating lever;

and a link arm pivotally connected at its one end to the outer flap at a location spaced from the downstream end of the outer flap about an axis which is parallel with said previously mentioned axes, and pivotally connected at its opposite end about an axis which is fixed relative to the tube and which is also parallel with said previously mentioned axes.

4,538,998

SWIMMING AND LIFE SAVING DEVICE

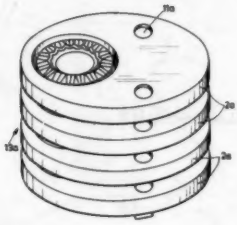
Bernd Hölzel, Robert-Bosch-Strasse 12, 6367 Karben 1, Fed. Rep. of Germany

Continuation of Ser. No. 285,269, Jul. 20, 1981, abandoned. This application Feb. 9, 1984, Ser. No. 578,307

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 3031019; May 8, 1981, 3118184

Int. Cl.³ B63C *9/10*

U.S. Cl. 441—122 **16 Claims**



1. A swimming device, comprising at least one floatation disk made throughout its disk volume of floatation foam material for permanently maintaining its buoyancy independently of any inflation, an arm passage opening in said disk, said disk having a given diameter and a given thickness which is small relative to said given diameter, said arm passage opening having a diameter smaller than an arm diameter at the location where the device is held on an arm in use, said device further comprising an elastic edge zone (4) made of elastic foam material and surrounding said arm passage opening in said floatation disk, said elastic foam material of said edge zone (4) having an elasticity which is sufficient for permitting pushing a hand and an arm through said arm passage opening and for surrounding a user's arm in a form-locking manner for properly holding the device on an arm by said form-locking when a swimmer moves his arms.

4,538,999

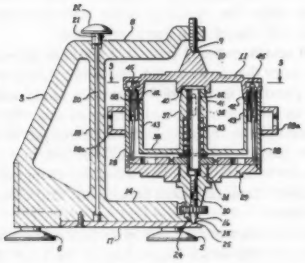
SPINNING TOY

Gerald J. Orlowski, Scottsdale, Ariz., assignor to Fun-Tech Products Company, Phoenix, Ariz.

Continuation of Ser. No. 249,776, Apr. 1, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 577,197

Int. Cl.³ A63H *11/02, 11/20, 13/16*

U.S. Cl. 446—259 **6 Claims**



6. A spinning toy having a hollow housing, a detachable cover, to said housing a cargo carrier in the housing, means in said housing responsive to attachment of the cover thereof to engage first detent means, means for rotating the toy, means in said housing for retaining the cover on the housing as the toy is rotated, means in said housing responsive to centrifugal force for transferring the engagement to second detent means, and means in said housing responsive to a decrease in centrifugal force for disengaging the second detent means whereby said cover is released and means for ejecting the cover and cargo upon release of the second detent means; and a launcher that serves as means for retaining the cover on the housing during the transition from first to second detent means, the launcher having means for disengaging the toy and moving it away to spin freely.

4,539,000

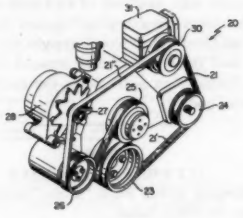
METHOD OF MAKING BELT TENSIONING MEANS

Melvin D. Gayer, Rock Prairie Township, Dade County, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 376,471, May 10, 1982, Pat. No. 4,478,594. This application Jun. 28, 1984, Ser. No. 625,425

Int. Cl.³ F16H *11/06*

U.S. Cl. 474—13 **10 Claims**



1. In a combination of a power transmission belt that is adapted to be moved in an endless path and a tensioner for said belt, the method of making said combination comprising forming a variable speed pulley having a rotatable hub comprising a support means of said tensioner fixed relative to said belt, providing a belt engaging means carried by said support means and being moveable relative thereto, operatively associating biasing means with said support means and said belt engaging means to urge said belt engaging means relative to said support means in a belt tensioning direction and against said belt with a force to tension said belt, forming an endless flexible sleeve, placing said sleeve around said hub to form diameter defining means, disposing said biasing means between said hub and said diameter means, and operatively associating a control means with said biasing means to progressively decrease its urging force on said belt engaging means during operation of said belt as the speed of movement of said belt progressively increases from a certain low speed of movement thereof to a certain high speed of movement thereof.

4,539,001

TENSIONING DEVICE FOR BELT OR THE LIKE

Yoshio Okabe, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 30, 1983, Ser. No. 567,159

Claims priority, application Japan, Dec. 31, 1982, 57-230811

Int. Cl.³ F16H *7/08*

U.S. Cl. 474—138 **5 Claims**

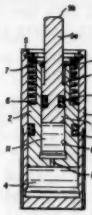
1. A hydraulic autotensioner of a sealed type comprising:

a body member defining a large diameter oil chamber;

a plunger sealingly inserted in a movable manner in said body member, said plunger having a small diameter oil chamber formed in the center thereof and a small passage which communicates said large and small diameter oil chambers;

a piston sealingly inserted in said plunger in a movable manner, said piston having a head extending outside of said body member, said piston head having an end face defining a press face;

a spring in said body member for biasing said plunger in the direction of said large diameter oil chamber; and



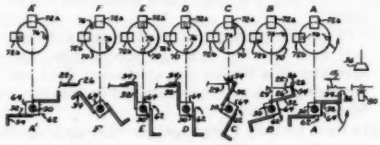
a snap ring arranged at an opening of said body member and engaging said spring.

4,539,002

CONTROL APPARATUS FOR TRAILING EDGE FOLDER IN CARTON FOLDING MACHINE

Chet Zak, Newbury, Mass., assignor to Post Machinery Company, Inc., Portsmouth, N.H.

Filed Jul. 23, 1982, Ser. No. 401,098
Int. Cl.³ B31B *1/54*
U.S. Cl. 493—23 **17 Claims**



1. Apparatus for controlling the operation of a trailing edge folder in a blank folding machine having conveyor means for continuously advancing blanks with trailing panels in a predetermined direction in untimed relationship to one another along a generally horizontal path, said folder having a rotatable shaft mounted below said path and transverse thereto, shaft operating means for rotating and stopping said shaft intermittently after at least one respective response time delay, and arm means mounted on said shaft and extending generally radially therefrom, said arm means having folding head means at the distal end thereof for folding over the respective trailing panel of each of said blanks, said control apparatus comprising:

blank sensing means responsive to the presence of a blank at a predetermined location along said path upstream of said folder for producing a trailing edge signal when the trailing edge of the blank leaves said location;

panel length advance means, responsive to an input signal, for producing a panel length output signal at the end of an interval after said input signal which interval is substantially complementary to the length of said trailing panel, said panel length advance means including a panel length advance counter having a clock input terminal, means for applying clock pulses to said clock input terminal of said panel length advance counter at a rate related to the operating speed of said folding machine, and means for producing said panel length output signal upon the counting of a predetermined number of clock pulses;

response time advance means, responsive to an input signal, for producing a response time output signal at the end of an interval after said input signal which interval is substantially complementary to one of said respective response time delays of said shaft operating means, said response time advance means including a response time advance counter having a clock input terminal, means for applying clock pulses to said clock input terminal of said response time advance counter at a rate related to the operating speed of said folding machine, and means for producing said response time output signal upon the counting of a predetermined number of clock pulses;

means for applying said trailing edge signal as an input signal to one of said panel length advance means and said response time advance means;

means for applying the output signal of one of said panel length advance means and said response time advance means as an input signal to the other of said panel length advance means and said response time advance means to develop a first advance control signal at the end of an interval after said trailing edge signal which is substantially the sum of said interval substantially complementary to said length and said interval substantially complementary to one of said respective response time delays;

first advance control means responsive to said first advance control signal for causing said shaft operating means with at least one respective response time delay to rotate said shaft so that said folding head means moves generally in said predetermined direction to fold over said trailing panel;

first position sensing means, responsive to the rotation of said shaft to a first predetermined position, for producing a first position signal indicative thereof;

means for applying said first position signal as an input signal to said response time advance means to develop a respective response time output signal as a first stop control signal;

first stop actuating means responsive to said first stop control signal for causing said shaft operating means with at least one respective response time delay to stop said shaft;

pause means, responsive to said first stop control signal and the operation of said conveyor means, for developing a second advance control signal at the end of a predetermined pause interval after said first stop control signal;

second advance control means, responsive to said second advance control signal, for further causing said shaft operating means to rotate said shaft after said predetermined pause interval;

second position sensing means, responsive to the further rotation of said shaft to a second predetermined position, for producing a second position signal indicative thereof;

means for applying said second position signal as an input signal to said response time advance means to develop a respective response time output signal as a second stop control signal; and

second stop actuating means, responsive to said second stop control signal, for causing said shaft operating means with at least one respective response time delay to stop said shaft in a dwell position where said folding head means is clear of said path.

4,539,003

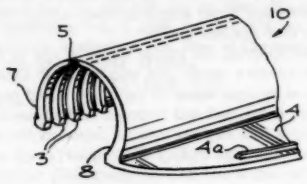
ANGIO-CATHETER/INFUSION TUBING LOCK

Annabelle D. Tucker, 4480 Sherman Oaks Cir., Sherman Oaks, Calif. 91403

Filed Jan. 24, 1983, Ser. No. 435,774
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—93 **7 Claims**

1. A safety locking clamp to secure various size friction couplers in intravenous feeding systems comprising an elongated hollow tubular body formed of resiliant plastic material, said body being provided with an elongated slot extending the entire length of the body, said clamp body having an internal wall structure with ridge means formed internally around the circumference thereof at each end of said body, said clamp further having pull tab means extending laterally from the slot edges whereby said resiliant clamp body may be applied over a coupling by pulling the slot wider and thereafter releasing it

over the coupling via said pull tab means, said clamp wall having increased thickness at the junction area of slot edges



and pull tab means to provide added gripping strength to said clamp in this area.

4,539,004

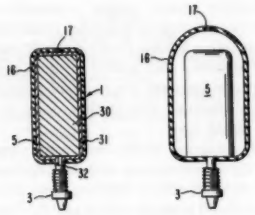
SELF-DRIVEN PUMP ASSEMBLY AND METHOD OF OPERATION

James B. Eckenhoff, Los Altos; Virgil A. Place, Half Moon Bay, and John R. Peery, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 421,597, Sep. 22, 1982, Pat. No. 4,474,575, which is a continuation-in-part of Ser. No. 344,288, Feb. 1, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 602,937

Int. Cl.³ A61M 5/00

U.S. Cl. 604—131 **4 Claims**



1. A pump assembly for delivering small amounts of a fluid for a prolonged period of time comprising, in combination:

(a) fluid impermeable container means provided with outlet means;

(b) fluid imbibing pump means mounted within said container means the outlet of said pump means being in fluid communicating relationship to the outlet in said container means, the interior of said container means and the exterior of said pump means defining therebetween a fluid receiving volume sufficient, when charged with actuating fluid to actuate said pump; and

(c) at least a portion of said fluid impermeable container means being formed from a flexible, collapsible, impermeable material which portion has a collapse capacity at least equal to the discharge capacity of said fluid imbibing pump, whereby imbition of fluid contained within the fluid receiving volume during actuation of said pump means will not create a vacuum of said fluid imbibing pump means.

4,539,005

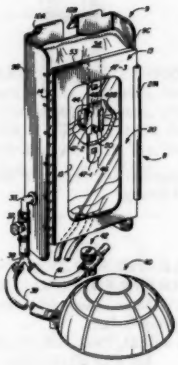
BLOOD INFUSION APPARATUS AND METHOD

Gordon M. Greenblatt, 5533 N. Third St., Phoenix, Ariz. 85012

Filed Oct. 24, 1983, Ser. No. 544,984

Int. Cl.³ A61M 5/00

U.S. Cl. 604—141 **12 Claims**



1. Fluid infusion apparatus comprising in combination:

(a) a unitary rigid enclosure with a back, and first and second sides;

(b) an inflatable bladder support in said enclosure against said back and said first and second sides for partially surrounding a flexible bag containing fluid, such as life sustaining fluid, and squeezing said flexible bag when said bladder is inflated;

(c) a rigid, partially transparent door having hinge means for pivotally connecting one edge of said door to a front edge of said first side;

(d) bladder supporting means for supporting said bladder against said back and said first and second sides;

(e) bag supporting means for supporting said flexible bag on an inner surface of said door and for effectuating rapid attachment of said flexible bag to and removal of said flexible bag from said inner surface of said door;

(f) latching means attached to an outer surface of said second side for quick release latching of said door to said second side;

(g) foot operable pumping means for effectuating rapid inflation of said bladder to a pressure that effectively, rapidly squeezes fluid out of said flexible bag;

(h) first tubing means connected to said foot operatable pumping means for conducting pressurized air from said pumping means into said bladder, said first tubing means having sufficient air conducting capacity to allow said rapid inflation;

(i) relief valve means disposed in series relationship with said first tubing means and said pumping means for limiting the amount of air pressure in said bladder to a predetermined pressure;

(j) dump valve means in communication with tubing and outside atmosphere for effectuating essentially immediate deflation of said bladder to the outside atmosphere, to thereby allow safe opening of said door and replacement of an empty flexible bag by a full one; and

(k) second tubing means in open communication with said first tubing means for conducting pressurized air out of said bladder through said dump valve means, and having sufficient air conducting capacity to allow said essentially immediate deflation,

wherein said foot operatable pumping means has sufficient pumping capacity to inflate said bladder to a predetermined infusion pressure with only several actuations of said foot operatable pumping means by the foot of an operator.

4,539,006

LEATHER TREATMENT

Nathaniel P. Langford, Somerset Township, St. Croix County, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 531,932, Sep. 13, 1983,. This application Aug. 1, 1984, Ser. No. 634,829

Int. Cl.[3] C08K *5/16*

U.S. Cl. 8—94.1 R 14 Claims

1. Method of treating a material selected from the group consisting of leather, textiles, and cellulosics in order to provide enhanced water and oil repellancy thereto comprising the step of applying to said material a composition comprising a compound represented by the formula:

$$R_f—Q—A$$

wherein

R_f represents a member selected from the group consisting of

$$C_nF_{2n+1}SO_2N(R^1) \text{ and } C_nF_{2n+1}(R^2)$$

n represents a positive integer from 3 to 20, inclusive,

R represents an alkyl radical having 1 to 4 carbon atoms,

R^1 represents an alkylene radical having 1 to 12 carbon atoms,

R^2 represents an alkylene radical having 1 to 4 carbon atoms,

A represents a hydrocarbon group having from 5 to 36 carbon atoms, said hydrocarbon group having at least one unsaturated site, said hydrocarbon group optionally being substituted with a hydroxyl group or a carboxyl group,

Q represents a member selected from the group consisting of

$$—CO—, —CNH—, —OCNH, —CS—,$$

$$—NHCNH—, —OCNH—T—NHCO—$$

wherein T represents an aliphatic group, a cycloaliphatic group, or an aromatic group.

4,539,007

PROCESS FOR THE SIMULTANEOUS DESIZING AND BLEACHING OF TEXTILE MATERIAL MADE FROM CELLULOSE FIBERS

Günter Rösch, Bad Soden am Taunus, and Gerhard Sauer, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 9, 1983, Ser. No. 492,821

Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218889

Int. Cl.[3] D06L *3/02, 1/06, 1/14, 3/00*

U.S. Cl. 8—111 4 Claims

1. A process for the simultaneous desizing and bleaching of textile material made from cellulose fibers, which comprises treating the textile material with a liquor containing per liter of water

(a) from 1 to 10 grams of a peroxide activator,

(b) from 10 to 80 ml of hydrogen peroxide,

(c) from 1 to 10 grams of urea,

(d) from 1 to 10 grams of a surfactant and a compound of weakly alkaline reaction in such an amount that the pH of the liquor is 7 to 8.

4,539,008

AGENTS TO PRODUCE DURABLE PRESS LOW FORMALDEHYDE RELEASE CELLULOSIC TEXTILES: ETHERIFIED N,N-BIS(HYDROXYMETHYL)-CARBAMATES

Bethlehem K. Andrews, and Robert M. Reinhardt, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 586,618, Mar. 6, 1984, Pat. No. 4,488,878. This application Aug. 8, 1984, Ser. No. 638,827

Int. Cl.[3] D06M *13/40;* C07C *125/06*

U.S. Cl. 8—187 8 Claims

1. A process to produce new etherified hydroxymethylated carbamates which can be used to treat cellulosic textiles to give durable press properties and low formaldehyde release comprising: reacting hydroxymethylated organic carbamates with water soluble alcohols for sufficient time and temperature to produce a new etherified hydroxymethylated carbamate.

4,539,009

DYESTUFF MIXTURE

Horst Nickel, and Hans-Günter Otten, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

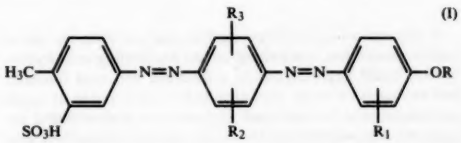
Filed Nov. 2, 1984, Ser. No. 667,525

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1983, 3340272

Int. Cl.[3] C09B *67/22;* D06P *1/06*

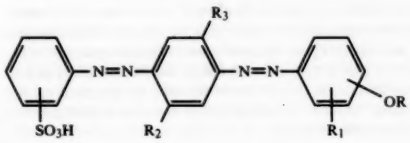
U.S. Cl. 8—641 5 Claims

1. Mixture of disazo dyestuffs which, in the form of the free acid, have the formula



(I)

and disazo dyestuffs which, in the form of the free acid, have the formula



(II)

wherein, independently of each other,

R denotes optionally substituted alkyl,

R_1 denotes H or alkyl and

R_2 and R_3 each denote H, alkyl or alkoxy the mixture comprising 20–60% by weight of dyestuff I and 80–40% by weight of dyestuff II.

4,539,010

COAL PREPARATION

David E. Mainwaring, and Charles U. Jones, both of Melbourne, Australia, assignors to Australia Limited and The Broken Hill Proprietary Company Limited, both of, Australia

Filed Dec. 23, 1983, Ser. No. 566,874

Claims priority, application Australia, Dec. 24, 1982, PF07458

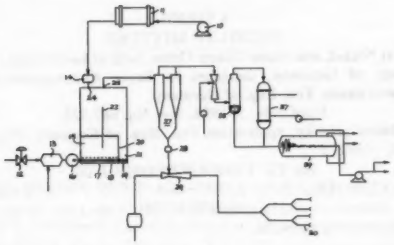
Int. Cl.[3] C10L *9/08, 5/22*

U.S. Cl. 44—1 C 14 Claims

1. A method of preparing fine particulate coal for use in power generation which comprises crushing mined coal into

small sized particles, wetting said fine coal particles with a hydrocarbon liquid and forming carbonaceous agglomerates of said fine particles, separating said carbonaceous agglomerates from non-carbonaceous material present in said coal, passing said agglomerates into a fluidized bed which is fluidized with steam in the absence of oxygen to remove a portion of said hydrocarbon liquid, subsequently passing said treated agglomerates into a high velocity stream of steam to disintegrate said agglomerates into fine particles of coal and remove a further portion of said hydrocarbon liquid, and subsequently separating out said fine coal particles and condensing said steam and hydrocarbon liquid to allow recovery and recycling of said hydrocarbon liquid.

2. A method as in claim 1 and further comprising, altering the rate of production of fine coal particles in response to sensing means responsive to the demand for steam production to actuate changes in agglomerate feed rate and pressure and/or temperature of the steam in the fluidized bed.



9. An apparatus for preparing fine coal particles for use in power generation, comprising means for feeding coal-hydrocarbon liquid agglomerates to a fluidized bed, said fluidized bed having at its lowest part an inlet for steam and in its upper portion an inlet for said coal agglomerates and an outlet for agglomerates intermediate the height of said fluidized bed, said outlet feeding said treated agglomerates into a tubular conveyor having a high velocity steam inlet at one end and a means for separating out fine coal particles from said steam at the other end.

10. Apparatus as claimed in claim 9 which includes control means comprising means responsive to steam production in a power generation plant, adapted to activate changes in production of coal agglomerates being fed to the fluidized bed and to actuate changes in the temperature and or pressure of the steam being fed to the fluidized bed to alter the rate of production of fine coal particles.

4,539,011

ARTIFICIAL FIREPLACE LOG

Günther Kretzschmann, Münster-Sarmsheim, Fed. Rep. of Germany, assignor to Anasco Gesellschaft mit beschränkter Haftung, Ingelheim am Rhein, Fed. Rep. of Germany

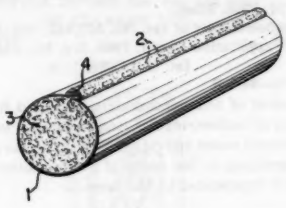
Filed Jul. 12, 1983, Ser. No. 512,959

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227148; Nov. 13, 1982, 3242064

Int. Cl.³ C10L *5/36, 11/06*

U.S. Cl. 44—14 **5 Claims**

1. A firewood substitute product consisting of a difficultly flammable elongated sleeve made of cardboard, kraft paper, difficultly flammable plastic, brittle flammable plastic foil or glassfiber fabric, which surrounds an easily flammable white coal lighter emulsion filling consisting of a mixture of wood wastes with paraffins, waxes, stearic acid or by-products from the production of stearic acid and comprising a hardener, said sleeve comprising a longitudinally extending slit or plurality of apertures covered by an ignition ridge consisting of flammable filling.



3. A firewood substitute product of claim 1, where said sleeve comprises a longitudinally extending plurality of apertures.

4,539,012

PITCH-CONTAINING COMPOSITION

Osamu Ohzeki, Fukui; Katsuhiko Shimakawa, Sabae, and Zenichi Mashino, Soka, all of Japan, assignors to Nikka Chemical Industry Co., Ltd. and Chiyoda Chemical Enginrng & Constrct. Co. Ltd., both of Kanagawa, Japan

Filed Mar. 22, 1984, Ser. No. 592,066

Claims priority, application Japan, Mar. 24, 1983, 58-49512

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 **21 Claims**

1. A composition in the form of a slurry which is stable at 25° C. for at least 24 hours, comprising

an aqueous medium;

a finely divided solid petroleum pitch; and

a dispersant in an amount sufficient for maintaining said pitch in the dispersed state, said dispersant being at least one member selected from the group consisting of (A) a compound having the following general formula:

$$Z—(Y—X)_p$$

wherein

Z is an organic radical capable of forming, together with p number of hydrogen atom, an active hydrogen-containing organic compound of the formula $Z—(H)_p$ where H is the active hydrogen and p is a positive integer,

Y is a polyoxyalkylene group consisting essentially of a plurality of monomer units, said monomer unit being at least one member selected from $—CH_2—CH_2—O—$ and $—CH_2—CHCH_3—O—$,

X is a hydrogen atom, and

p has the same meaning as above, (B) polymeric material obtained by crosslinking the compound (A) with a crosslinking agent, (C) a salt of the sulfuric ester of the compound (A) and (D) a salt of the sulfuric ester of the polymeric material (B).

4,539,013

PROCESS FOR TREATING GASOLINE OR GASOHOL BY CONTACT WITH KF OR K_2CO_3

William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 7, 1981, Ser. No. 309,535

Int. Cl.³ C10L *1/30*

U.S. Cl. 44—56 **21 Claims**

1. The method of treating a water-containing hydrocarbon charge fuel containing at least one fuel selected from the group consisting of water-containing hydrocarbon fuel boiling in the gasoline boiling range and water-containing gasohol which comprises

contacting said charge water-containing fuel with a salt

selected from the group consisting of potassium fluoride and potassium carbonate thereby forming a multi-phse system including (i) a first phase of supernatant fuel containing less water than is present in said charge fuel and (ii) a second phase containing aqueous solution of said salt; and

recovering said first phase containing less water than is present in said charge fuel.

4,539,014

LOW FLASH POINT DIESEL FUEL OF INCREASED CONDUCTIVITY CONTAINING AMYL ALCOHOL

William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,507

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—56 **11 Claims**

1. The method of increasing the conductivity of a single phase extended hydrocarbon fuel heavier than gasoline which comprises

mixing (i) an extended hydrocarbon fuel heavier than gasoline and (ii) a conductivity-improving amount of 0.01–5 parts, per 100 parts of base fuel, of as a conductivity additive, at least one pentanol selected from the group consisting of 3-methyl-1-butanol and 2-methyl-1-butanol thereby forming a single phase high conductivity hydrocarbon fuel heavier than gasoline; and

recovering said single phase high conductivity hydrocarbon fuel heavier than gasoline.

4,539,015

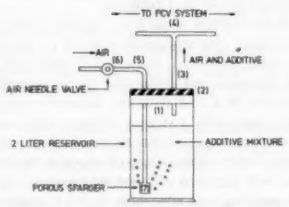
BURNING EFFICIENCY ENHANCEMENT METHOD

Robert J. Tedeschi, R.D. 3, Box 143, Whitehouse Station, N.J. 08889, and Lincoln I. Diuguid, 1215 S. Jefferson, St. Louis 4, Mo. 63104

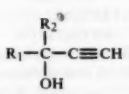
Continuation-in-part of Ser. No. 236,704, Feb. 23, 1981, abandoned. This application Jan. 10, 1985, Ser. No. 690,458

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—77 **11 Claims**



1. A method of increasing the burning efficiency of liquid fuels in fuel burning systems having fuel reservoirs comprising adding to the fuel in said system between 0.5 and 7 parts per thousand by volume of an alkynyl alcohol of the formula



wherein R_1 and R_2 are selected from the group consisting of hydrogen, alkyl, cycloalkyl or carbocycloaryl wherein the alkyl groups contain from 1–12, the cycloalkyl contain from 3–12 and the carbocycloaryl groups contain from 5–12 carbon atoms respectively, and R_1 and R_2 may be the same or different.

4,539,016

METHOD OF AND APPARATUS FOR ADJUSTING AND MAINTAINING CONSTANT THE TEMPERATURE DURING METHANIZING OF A CHARGE GAS

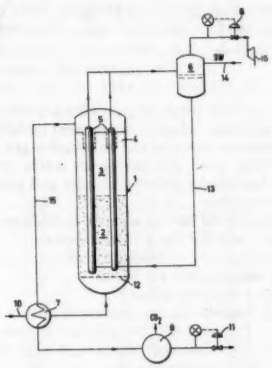
Claus Flockenhaus, Essen; Erich Hackler, Kettwig, and Werner Lommerzheim, Müilheim, all of Fed. Rep. of Germany, assignors to Thyssengas G.m.b.H., Duisburg-Hamborn and Didier Engineering, Essen, both of, Fed. Rep. of Germany

Continuation of Ser. No. 68,490, Aug. 21, 1979, abandoned, which is a continuation of Ser. No. 847,550, Nov. 1, 1977, abandoned. This application Apr. 24, 1981, Ser. No. 257,352

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2651567

Int. Cl.³ C10K *3/04*

U.S. Cl. 48—197 R **6 Claims**



1. Method for methanizing charge gases containing CO and H_2 in a fluidized bed reactor containing an upwardly extending fluidized bed zone containing a powdered catalyst and a separation zone located above the fluidized bed zone, flowing the charge gases upwardly through the fluidized bed zone from the lower end thereof and reacting the charge gases with the powdered catalyst in the fluidized bed, removing the heat generated in the reaction by an evaporating coolant and passing the evaporating coolant through the fluidized bed zone in indirect heat transfer relation with the powdered catalyst therein, adjusting the vapor pressure of the coolant before introducing it into the fluidized bed zone for maintaining a desired boiling temperature of the coolant in the fluidized bed zone, wherein the improvement comprises, maintaining an upwardly extending dust bed zone within the reactor between the upper end of the fluidized bed zone and the separation zone in the fluidized bed reactor with the powdered catalyst being present in the upwardly flowing charge gases in the dust bed zone as a cloud of powdered catalyst, reacting the charge gases with the cloud of powdered catalyst in the dust bed zone, separating the powdered catalyst from the charge gas within the separation zone whereby the separation step is completely effected within the reactor, removing the heat generated in the reaction from the dust bed zone and from the separation zone by flowing the evaporating coolant from the fluidized bed zone in indirect heat transfer relation serially through the cloud of powdered catalyst in the dust bed zone and then the separation zone, maintaining the temperature of the evaporating coolant in the range of 60° to 80° C. below the temperature in the fluidized bed zone and in a corresponding range of 50° to 70° C. below the temperature in the dust bed zone with the pressure of the evaporating coolant being adjusted for establishing the boiling temperature of the coolant.

4,539,017

ELASTIC GRINDING ELEMENT AND METHOD FOR PRODUCING IT

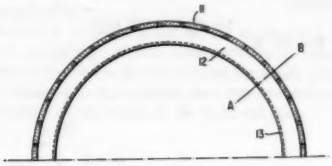
Rainer Augustin, Birkenfeld, Fed. Rep. of Germany, assignor to SEA Schleifmittel Entwicklung Anwendung GmbH, Pforzheim, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 496,955

Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219567

Int. Cl.³ B24D *11/00*

U.S. Cl. 51—293 **10 Claims**



1. A process for producing an elastic grinding element for form-true grinding, wherein the element includes a supporting layer of elastomer material and an abrasive grit layer bound to the supporting layer and having an active grinding surface made of a hardened mixture of binder and abrasive grit, said process comprising:

providing a mold having a shape constructed to produce a desired shape for the grinding element;

putting the mixture of binder and abrasive grit and the elastomer material into the mold;

providing a rotating system;

disposing the mold in the rotating system; and

subjecting the mold with the mixture of binder and abrasive grit and the elastomer material therein to a centrifugal force via the rotating system.

4,539,018

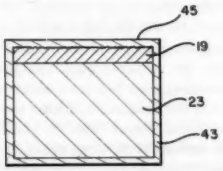
METHOD OF MANUFACTURING CUTTER ELEMENTS FOR DRILL BITS

James R. Whanger, and Ralph Staudenmayer, both of Houston, Tex., assignors to Hughes Tool Company—USA, Houston, Tex.

Filed May 7, 1984, Ser. No. 608,047

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—295 **8 Claims**



1. In a method of bonding a composite compact to a mounting stud of the type used to mount the compact as a cutter element in a drill bit where the composite compact has an abrasive portion having an exposed, abrasive surface which has previously been bonded to a substrate portion, the improvement comprising the steps of:

coating the exposed, abrasive surface of said composite compact with a thin, metal layer;

grinding said coated, abrasive surface of said composite compact to form a smoothly ground surface;

providing a brazing filler between said compact substrate portion and said mounting stud; and

contacting said smoothly ground surface of said composite compact with a heat sink while brazing said substrate portion of said composite compact to said mounting stud.

4,539,019

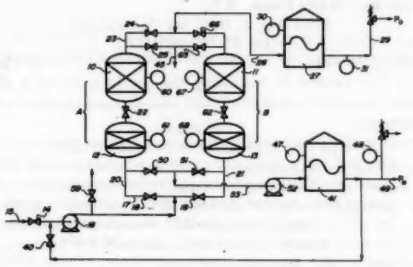
CONTROL SYSTEM FOR AIR FRACTIONATION BY SELECTIVE ADSORPTION

William R. Koch, Fleetwood, Pa., assignor to Air Products & Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 537,305, Sep. 29, 1983, abandoned. This application May 22, 1984, Ser. No. 612,821

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—21 **23 Claims**



1. In the operation of a cyclic system for recovery of an enriched-oxygen effluent product by selective adsorption of nitrogen from an ambient air feed stream, wherein said ambient air previously freed of contained water and CO_2 is passed through a bed of solid adsorbent selective in retention of nitrogen as opposed to oxygen, with resulting production of an oxygen-enriched gaseous effluent which is withdrawn from said bed and collected in a receiver; and wherein the resulting nitrogen-loaded adsorbent is desorbed by application of vacuum thereto, followed by repressuring of the adsorbent bed with a portion of said oxygen-enriched gaseous effluent; the improvement which comprises automatically controlling the duration of the air feed step by monitoring the inventory of oxygen-enriched gas in said receiver.

5. In the fractionation of air by a vacuum swing adsorption process comprising the sequential steps of (1) introducing the air, freed of water and CO_2, into a bed of adsorbent selective in retention of nitrogen and collecting the unadsorbed oxygen-enriched effluent in a first receiver; thereafter (2) rinsing the nitrogen-laden bed with a stream of high purity nitrogen gas withdrawn from storage in a second receiver; (3) desorbing the nitrogen-laden bed by application of vacuum thereto and passing the desorbed nitrogen effluent into said second receiver; and (4) repressuring said adsorbent bed by admission of oxygen-enriched gas therein withdrawn from said first receiver; the improvement which comprises controlling the duration of steps (1) and/or (2) respectively by monitoring the gas inventory in said first and/or second receivers.

4,539,020

METHODS FOR OBTAINING HIGH-PURITY CARBON MONOXIDE

Toshikazu Sakuraya; Tetsuya Fujii, both of Chiba; Shigeo Matsui, and Shigeki Hayashi, both of Shiga, all of Japan, assignors to Kawasaki Steel Corporation, Kyogo and Osaka Sanso Kogyo Ltd., Osaka, both of, Japan

Filed Jun. 18, 1984, Ser. No. 621,789

Claims priority, application Japan, Jul. 10, 1983, 58-188117; Oct. 6, 1983, 58-187479

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **17 Claims**

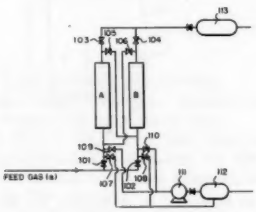
1. A process for separating carbon monoxide from a feed gas

comprising $C0_2$, CO and a less adsorbable component than CO through PSA by using at least two adsorption columns in a two stage adsorption operation which comprises a first adsorption stage for removing $C0_2$ from said feed gas and a second adsorption stage for separating CO from gaseous mixture withdrawn from the first adsorption stage:

(1) the first adsorption stage comprising a pressure swing adsorption, repeating adsorption and desorption by using at least two first stage columns containing an adsorbent exhibiting a selective adsorption property to carbon dioxide to remove carbon dioxide from said feed gas, and

(2) the second adsorption stage comprising a process for separating carbon monoxide from the gaseous mixture, which has been withdrawn for the first adsorption stage, through PSA by using at least two second stage adsorption columns containing an adsorbent exhibiting a selective adsorption property to carbon monoxide which comprises:

(i) pressurizing a second stage adsorption column by a first stage product gas which has been withdrawn from the first adsorption stage, in which the step (vi) was previously completed;



(ii) introducing the first stage product gas into the second stage adsorption column, in which step (i) was previously completed, so as to effect adsorption of carbon monoxide;

(iii) connecting the second stage adsorption column in which step (ii) was previously completed, to the other second stage absorption column in which step (v) was previously completed, to reduce the pressure in the former adsorption column, and increase pressure in the latter adsorption column;

(iv) purging a less adsorbable component than CO by passing product gas through the second stage adsorption column, in which step (iii) was previously completed;

(v) evacuating the second stage adsorption column, in which step (iv) was previously completed, to recover carbon monoxide adsorbed by the adsorbent of the adsorption column; and

(vi) connecting the second stage adsorption column, in which step (v) was previously completed, to the other adsorption column, in which step (ii) was previously completed to increase pressure in the former column,

periodically switching to the flow among said adsorption columns so as to repeat the above steps in the columns.

4,539,021

GAS FILTERING METHOD USING FABRIC FILTER

Thomas P. Hager, Reynoldsburg, and Larry W. Ferguson, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 368,074, Apr. 14, 1982, Pat. No. 4,450,197. This application Feb. 27, 1984, Ser. No. 584,287

Int. Cl.³ B01D *46/00, 47/00*

U.S. Cl. 55—97 **3 Claims**

1. A method for removing entrained particles from a gas which comprises passing gas through a glass fiber fabric, wherein said fabric glass fibers have been sized with a size comprising starch and a lubricant, then impregnated with an aqueous solution comprising:

(a) emulsified polytetrafluoroethylene resin;

(b) emulsified acrylic resin coalesceable to form a coherent film upon drying an aqueous dispersion thereof, said resin having a minimum film-forming temperature not greater than about 10° C.;

(c) a thickening agent comprising base-solubilized polyacrylic acid and,

(d) a polyhydrolyzable organosilane having non-hydrolyzable amine functionality, or hydrolysis condensation products of said organosilane, or a combination thereof; said glass fibers having been dried to deposit the non-volatile residue thereof in the interstices and on the outer surface of said glass fibers.

4,539,022

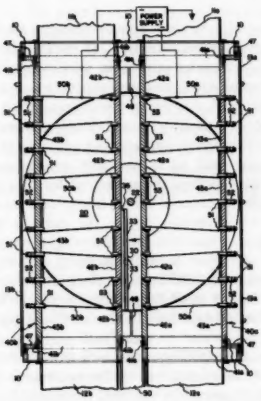
ROTATING DISK ELECTROSTATIC PRECIPITATOR WITH REMOVABLE UNIFORM FLOW DUCT

Joseph R. McLoughlin, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,202

Int. Cl.³ B03C *3/10, 3/47, 3/76*

U.S. Cl. 55—114 **8 Claims**



1. An electrostatic precipitator for removing particulate matter from a gas containing such matter, said precipitator comprising:

at least two rotatable electrically conductive disks mounted on a single shaft and separated so as to define a substantially cylindrical volume therebetween;

a sealable, electrically insulated housing surrounding said at least two disks, said housing having at least one inlet port and at least one outlet port for supplying said particulate gases to said volume between said at least two disks;

at least one substantially rectangular cross section duct within said housing for providing flow communication of said gas between said at least one inlet port and said at least one outlet port, said at least one duct being configured so that said at least two disks form a portion of the side walls thereof, said at least one duct being constructed and arranged for movement as a unit into and out of said housing;

at least one wire electrode supported from said at least one duct so as to lie approximately midway between said at least two disks;

a pair of wiper blades disposed outside of said at least one duct, adjacent to said shaft and positioned and arranged for removing particulate matter on said at least two disks; and

chute means for removal of said particulate matter scraped from said at least two disks by said wiper blades;

whereby the flow of gas through said precipitator is such as not to impart significant centrifugal velocities to said gas or to said particulate matter.

4,539,023

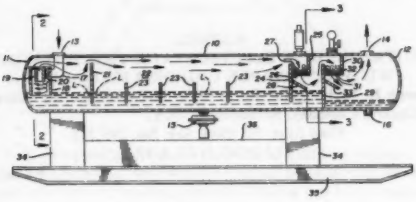
HORIZONTAL GAS AND LIQUID SEPARATOR

Robert E. Boley, 2025 Harsh Ave. SE., P.O. Box 525, Massillon, Ohio 44648

Filed Oct. 29, 1984, Ser. No. 665,966

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—174 **7 Claims**



1. A gas and liquid separator comprising an elongated horizontally disposed separation tank, an inlet port into said separation tank and an outlet port from said separation tank, a first separation means within said separation tank in communication with said inlet port, a series of transverse baffles in said separation tank in longitudinally spaced relation, two of said series of transverse baffles extending across a majority of the interior of said separation tank so as to form passageways above and below said two baffles, the other baffles of said series being positioned below the axial center line of said separation tank so as to form a passageway below the same, a partition transversely of said separation tank forming a passageway thereabove, said partition being positioned downstream of said series of transverse baffles, secondary and third baffles positioned transversely of said separation tank, one being in spaced relation to one of said two baffles and said partition and the other being positioned between said partition and said outlet port so as to form passageways below said secondary baffles and with said one of said two baffles and said partition forming a tortuous passageway for gas flowing through said separation tank, said separation tank formed to contain separated liquid in said passageway below said baffles and mist extraction means in said tortuous passageway.

4,539,024

SCRUBBER FOR THE DESULFURIZATION OF FLUE GASES

Werner Stehning, Dorsten, and Horst D. Nüsser, Castrop-Rauxel, both of Fed. Rep. of Germany, assignors to Gottfried Bischoff Bau kompl. Gasreinigungs -und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft, Essen, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 570,038

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301688

Int. Cl.³ B01D *45/08, 47/06*

U.S. Cl. 55—223 **5 Claims**

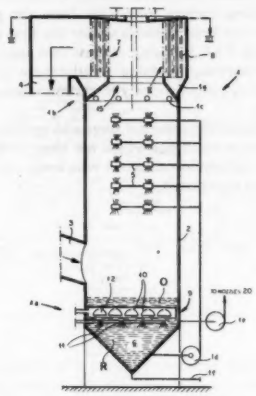
1. A scrubbing column for the desulfurization of a flue gas of fossil-fuel combustion comprising:

a substantially cylindrical upright tower having a head at an upper end and a sump at the lower end thereof;

means for feeding said flue gas to said tower at a location above said sump whereby said flue gas rises in said tower to said head;

means for scrubbing the flue gas rising in said tower with a scrubbing liquid, said scrubbing liquid being collected in said sump, said scrubbing liquid constituting a suspension of calcium sulfite and/or calcium sulfate;

a liquid separator in said head, said liquid separator comprising a substantially cylindrical crown of angularly separated registers surrounding a central plenum communicating with said registers, said crown of registers being surrounded by a discharge passage whereby flue gas from said tower enters said plenum, radially traverses said registers and flows through said passage, each of said registers comprising a plurality of impingement-baffle



separators traversed in succession by the flue gas and spaced from one another; and

an outlet on said head radially offset from the liquid separator and communicating with said passage, said passage being of increasing flow cross section in the direction of said outlet, each of said impingement-baffle separators comprising a plurality of vertically oriented baffle plates, each being of zigzag cross section in radial direction and provided with means for enabling collected water to pass downwardly.

4,539,025

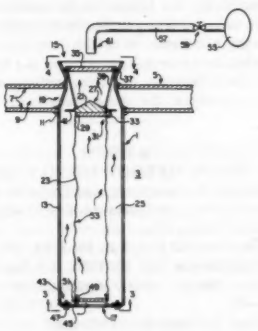
FILTERING SYSTEM

David F. Ciliberti, Murrysville Boro, and Thomas E. Lippert, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 26, 1984, Ser. No. 654,697

Int. Cl.³ B01D *46/04*

U.S. Cl. 55—302 **23 Claims**



1. A filter system for separation of particulate material from

a flow of gas containing the same wherein said flow of gas is passed to an enclosure comprising:

a cylindrical shell having an impervious wall, said shell open at both ends thereof and having a constricted section adjacent one open end;

means for supporting the cylindrical shell within the said enclosure such that gases entering the enclosure are discharged through said cylindrical shell;

means adjacent said one open end for supporting a filter tube coaxially within said cylindrical shell spaced from said impervious wall to form an annular chamber therebetween;

means for securing said filter tube to the other end of said cylindrical shell to seal said other end such that gases entering said cylindrical shell pass through said filter tube and into said annular chamber prior to discharge through said one open end; and

means to provide a jet pulse of fluid to said annular chamber to flex the filter tube inwardly relative to said impervious wall.

4,539,026

SUCTION CLEANER BAG

Harbey, Kuplas, North Wembley, England, assignor to The Hoover Company, North Canton, Ohio

Division of Ser. No. 374,161, May 3, 1982, Pat. No. 4,452,618. This application Jan. 6, 1984, Ser. No. 568,898

Claims priority, application United Kingdom, May 7, 1981, 8113955; Dec. 10, 1981, 8137344

Int. Cl.³ B01D *46/02, 46/52*

U.S. Cl. 55—376 **3 Claims**

1. A pleated bag having an aperture therein and an apertured collar attached thereto about said bag aperture, and including;

(a) said collar having a margin extending therearound,

(b) at least a first tab attached to the collar and extending along said margin and jutting outwardly from said margin,

(c) said tab spaced outwardly from such margin to form a slot between said tab and said margin,

(d) said first tab is formed in alignment with at least a second tab attached to said collar,

(e) said second tab is spaced from said margin to form a slot therebetween and juts outwardly therefrom,

(f) said tabs include a hook-shaped portion at their free ends,

(g) said first tab and said second tab attached to a single edge of said margin and extending generally parallel thereto, and

(h) said tabs being substantially aligned with each other in end to end relationship.

4,539,027

DUST BAG FOR USE IN A VACUUM CLEANER

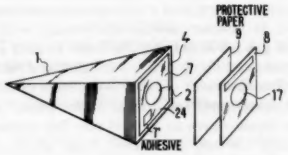
Mikael Förnäs; Raimo Sipilä , and Altti Lehto, all of Rauma, Finland, assignors to Raupak Oy, Rauma, Finland

Filed Sep. 26, 1983, Ser. No. 535,589

Claims priority, application Finland, Sep. 29, 1982, 823339

Int. Cl.³ B01D *46/02*

U.S. Cl. 55—378 **4 Claims**



1. A dust bag for use in a vacuum cleaner, said dust bag comprising an actual bag portion (1) and a mouth (2), said bag portion being made of an air-permeable material, the bag being installable in the vacuum chamber (3) of a vacuum cleaner with the bag portion's end (4) adjacent to said mouth fitted pressure-tightly against a coupling (6) of a dust tube (5) leading to said vacuum chamber, the mouth in communication with said dust tube, wherein the external surface of the dust bag's end (4) adjacent to its mouth (2) is provided with attachment means comprising an adhesive on a portion of the external surface thereof for securing said end of the dust bag to a desired cassette plate (8), for installing the dust bag in a desired vacuum cleaner; and wherein said adhesive is overlaid with a protective paper positioned and arranged so as to be removed from the surface thereof, said paper being removed from said adhesive by the user prior to securing said dust bag end to the cassette plate.

4,539,028

METHOD AND APPARATUS FOR COOLING AND LIQUEFYING AT LEAST ONE GAS WITH A LOW BOILING POINT, SUCH AS FOR EXAMPLE NATURAL GAS

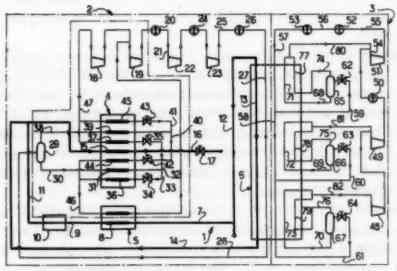
Henri Paradowski, Cergy Pontoise, and Didier Leroux, Courbevoie, both of France, assignors to Compagnie Francaise d'Etudes et de Construction "Technip" , Paris, France

Filed Apr. 26, 1984, Ser. No. 604,049

Claims priority, application France, May 6, 1983, 83 07620

Int. Cl.³ F25J *1/02*

U.S. Cl. 62—9 **21 Claims**



1. A method of cooling and liquefying at least one gas having a low boiling point through heat exchange with at least one part of a main refrigerating fluid precooled until its at least partial liquefaction through heat exchange with an auxiliary refrigerating fluid, said refrigerating fluids being part of an

incorporated cold-generating cascade of at least these two refrigerating fluids, each refrigerating fluid consisting of a mixture of several component substances, and said main refrigerating fluid evolving according to a closed-loop cooling cycle while successively undergoing therein: at least one compression in the gaseous state, at least one preliminary cooling with at least partial condensation, through heat exchange with said auxiliary refrigerating fluid, at least one separation of the liquid and vapor phases thus obtained, at least one refrigeration with total liquefaction and then sub-cooling and thereafter expansion through subsequent heat exchange and resulting attendant vaporization, in countercurrent relationship with itself and with the said gas for liquefying the latter at least partially, its vapor thus reheated being finally recycled and recompressed, wherein the improvement consists in the steps of once expanding said condensed and sub-cooled vapor phase of the main refrigerating liquid down to at least one first pressure, and of once expanding the said sub-cooled liquid phase of the main refrigerating fluid down to at least one second pressure, different from the said first pressure.

4,539,029

PROCESS AND AN APPARATUS FOR THE DIVISION OF MELTS

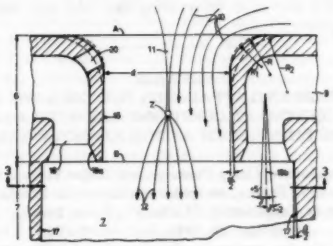
Edgar Muschelknautz, Leverkusen; Norbert Rink, Dormagen, and Georg Chalupka, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 576,044

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305809

Int. Cl.³ C03B *37/06*

U.S. Cl. 65—5 **6 Claims**



1. A drawing nozzle for the division of melts according to the nozzle blasting process, the nozzle comprising a nozzle inlet, propulsion jets entering the drawing nozzle below the nozzle inlet and a slightly divergent drawing-out part, and wherein:

(a) the contour of the nozzle inlet from the upper edge of the nozzle passes initially inside a radius $R_1 = 40\%$ of the narrowest cross-sectional dimension d of the drawing nozzle and then runs parallel to, or diverges by up to 2° from the drawing nozzle axis up to a depth below the upper edge of the drawing nozzle which is not greater than the narrowest cross-sectional dimension d of the drawing nozzle;

(b) the nozzle inlet is immediately adjoined by the drawing-out part, the upper cross-sectional dimension of which is from 1.5 to 2.4 times as wide as the narrowest cross-sectional dimension d of the drawing nozzle;

(c) the drawing-out part widens over a length of at least 6 times the narrowest cross-sectional dimension d of the drawing nozzle with a widening angle of from 1° to 2.4° and,

(d) in the intermediate cross section between the lower edge of the nozzle inlet and the upper edge of the drawing-out part, there are provided propulsion jet nozzles, the axis of which is inclined by from 5° to −2° to the drawing nozzle.

4,539,030

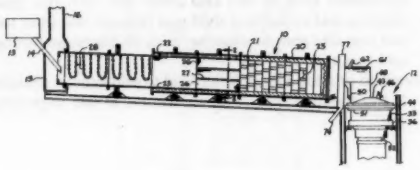
METHOD OF CALCINING AND LIQUEFYING GLASS BATCH

Henry M. Demarest, Jr., Natrona Heights, and Joseph M. Matesa, Plum Boro, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 3, 1983, Ser. No. 519,949

Int. Cl.³ C03B *5/10*

U.S. Cl. 65—27 **21 Claims**



1. A method of liquefying glass batch comprising feeding to a preheating vessel a first glass batch portion including a carbonate and substantially free of constituents that fuse at a temperature below the calcination temperature of the carbonate, heating the first batch portion in the preheating vessel to at least 1600° F. so as to calcine a substantial portion of the carbonate, discharging the heated first batch portion from the preheating vessel and feeding it before it has cooled to a liquefying vessel, feeding a second glass batch portion to the liquefaction vessel separately from the first glass batch portion, the second glass batch portion including constituents that would fuse at temperatures below the calcining temperature of the carbonate in the first glass batch portion, and heating the first and second portions in the liquefying vessel to liquefy the glass batch.

4,539,031

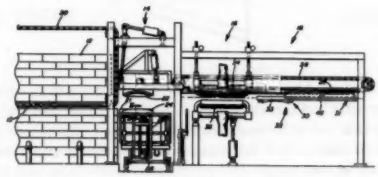
APPARATUS FOR PRESS SHAPING HOT GLASS SHEETS

Michael T. Fecik, Pittsburgh; Terry A. Bennett, Verona, and John J. Ewing, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 30, 1984, Ser. No. 575,231

Int. Cl.³ C03B *23/023*

U.S. Cl. 65—29 **1 Claim**



1. A method of bending hot glass sheets comprising:

providing a rigid, lower mold of ring-like configuration, the mold having a composite glass sheet supporting member having an outer sheet engaging layer of a heat insulating material that does not mar hot glass at elevated temperatures and a wire mesh reinforcement means, for imprinting a heated glass sheet, embedded within the thickness of the sheet engaging layer to separate said glass sheet supporting member into a upper portion that initially contacts the hot glass sheet and a lower portion for imparting a fine imprint on hot glass upon contact therewith, to indicate

deterioration of the glass sheet supporting member without marring the hot glass sheet to reject same due to excessive marking;

heating a glass sheet to temperature sufficient to bend the sheet and to imprint the sheet when exposed to the wire mesh reinforcement means;

positioning the heated glass sheet on the glass sheet supporting member;

lifting the mold to lift the heated glass sheet towards an upper vacuum mold;

engaging the hot glass sheet by vacuum against the upper vacuum mold to bend the hot glass sheet;

removing the hot glass sheet from engagement with the vacuum mold;

repeating said heating, positioning, lifting, engaging and removing steps with subsequently heated glass sheets;

examining selected ones of the bent sheets after the removing step to determine if the bent sheet has a fine imprint from said wire mesh reinforcement means indicating excessive wearing of said glass sheet supporting member and the need to replace same with a new member;

practicing said providing step after the practice of said examining step determines whether a bent glass sheet has a fine imprint; and thereafter

practicing said repeating and examining steps.

4,539,032

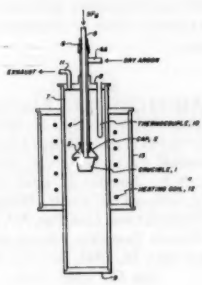
SF_6 PROCESS FOR DEHYDRATION OF FLUORIDE GLASSES

Danh C. Tran, Rockville, and Chester Fisher, Columbia, both of Md., assignors to Geo-Centers, Inc., Newton, Mass.

Filed Aug. 3, 1984, Ser. No. 637,433

Int. Cl.³ C03B *5/225, 5/00;* **C03C** *3/18*

U.S. Cl. 65—32 **2 Claims**



1. A method of making fluoride glasses having low OH and low oxide content, comprising the steps of:

(i) placing a fluoride glass charge containing ZrF_4 a crucible having a cap extending over the charge said cap providing a capped space above the charge and said cap being shaped such that gases can be fed into and out of the capped crucible,

(ii) disposing the capped charged crucible in a heating chamber,

(iii) causing dry argon gas to flow into through, and then out of the capped crucible while raising the temperature to thereby melt the charge in the crucible,

(iv) continuing the flow of dry argon gas into through, and then out of the capped crucible while maintaining a constant temperature for a sufficient time to obtain a homogeneous melt in which all crystalline materials are dissolved,

(v) while maintaining a water-free atmosphere over the melt, lowering the temperature in the heating chamber to a temperature between the glass crystallization temperature and a temperature near the sublimation temperature of ZrF_4,

(vi) maintaining said lowered temperature while causing a flow of a gas selected from the group of SF_6 and CF_4 to enter the capped space above the melt and flow therethrough for a time sufficiently long to substantially reduce OH and oxides in the glass melt, and

(vii) cooling the crucible and its contents while maintaining them in a water-free environment.

4,539,033

METHOD FOR DRYING OXIDE GLASSES

Keith J. Beales, Sproughton; Steve F. Carter, Ipswich; Sally Partington, Billercay, and Paul W. France, Woodbridge, all of England, assignors to British Telecommunications, London, England

Filed Sep. 8, 1983, Ser. No. 530,359

Claims priority, application United Kingdom, Sep. 10, 1982, 8225837

Int. Cl.³ C03B *5/00, 5/225*

U.S. Cl. 65—134 **11 Claims**

1. A method for drying an oxide glass, and thereby reducing the water content of the glass, which comprises providing glass in a molten state, and passing a drying gas through the glass while it is in the molten state, in which the drying gas is of a perhalogenated compound containing only halogen and non-halogen atoms, where the non-halogen atoms are either carbon or sulphur, and at least some of the halogen atoms in the perhalogenated compound are fluorine.

4,539,034

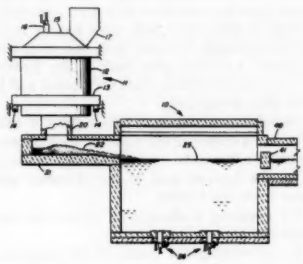
MELTING OF GLASS WITH STAGED SUBMERGED COMBUSTION

Henry P. Hanneken, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 19, 1984, Ser. No. 632,507

Int. Cl.³ C03B *5/10, 5/16*

U.S. Cl. 65—134 **20 Claims**



1. A method of melting glass or the like comprising:

initially liquefying batch material in a primary vessel by means of a first heat source associated with the first vessel, and wherein liquefied material runs off a melting surface;

draining the liquefied material from the first vessel to a separate secondary vessel and maintaining in the secondary vessel a body of the liquefied material in an at least partially unrefined condition;

advancing the liquefied material toward a refined state in the secondary vessel by injecting into the liquefied material at a submerged location a stream of gas that agitates the liquefied material and transfers heat to the liquefied material so as to effect at least partial refining.

20. Apparatus for melting materials comprising:

a primary melting vessel having means to feed batch material onto a sloped melting surface in the primary melting vessel, first heating means to liquefy batch material within

the primary melting vessel, and outlet means for draining liquefied material therefrom;

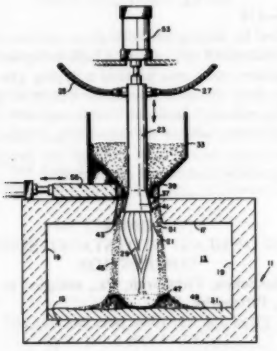
a secondary melting vessel associated with the primary vessel so as to receive drained liquefied material therefrom, adapted to maintain a body of liquefied batch material, and having second heating means adapted to inject radiating gas into the liquefied body.

4,539,035

METHOD AND APPARATUS FOR IMPROVING OXYGEN BURNER PERFORMANCE IN A GLASS FURNACE

Klaus A. Burckhardt, Spring City, and Jules C. Biessing, Southampton, both of Pa., assignors to Messer Griesheim Industries, Inc., Valley Forge, Pa.

Filed Mar. 26, 1984, Ser. No. 593,540
Int. Cl.³ C03B 5/16
U.S. Cl. 65—136 **10 Claims**



1. Apparatus for improving oxygen burner performance in a glass furnace having a chamber with a bottom wall connected to a roof wall by side walls, said walls having refractory surfaces, and an opening in the roof wall, said glass furnace being adapted to have a molten glass bath in the bottom which is adapted to be struck by flame from the burner and to be fed by cullet or the like, comprising

burner means for injecting a flame from a nozzle downwardly into a chamber through the roof opening with the flame being adapted to impinge against the bath of molten glass on the bottom wall of the chamber which is at a distance from the nozzle,

means for inserting a shower of cullet into the chamber through the roof opening, and

means for protecting the walls of the chamber from the radiant energy of the flame and from impingement by the flame, said means controlling the fall of the shower of cullet to form a shroud around the flame and to heat the shower of cullet and to form the cullet into an annular ridge of unmelted cullet on the top surface of the molten glass bath,

the distance of the nozzle from the glass bath being sufficient to allow the flame to heat the falling cullet in the shroud,

whereby said ridge deflects the flame upwardly when the flame bounces from the bath of molten glass so that the flame does not bounce horizontally and impinge directly against the near surface of the side walls, and

the shower of cullet shrouds the flame and protects the furnace walls from the radiant energy of the flame and from impingement by the flame, and the cullet picks up heat from the flame before falling onto the bath of molten glass.

9. A process for improving oxygen burner performance in a glass furnace having a chamber with a bottom wall connected to a roof wall by side walls, with an opening in the roof wall, said walls having refractory surfaces, said glass furnace being adapted to have a molten glass bath in the bottom and being adapted to be fed by cullet or the like, comprising

providing a bath of molten glass on the bottom wall of the furnace chamber,

injecting a flame from a nozzle downwardly into the chamber through the roof opening to impinge against the molten glass, which is at a distance from the nozzle, and bounce therefrom,

protecting the furnace walls from radiant energy of and impringement by the flame by controlling the fall of a shower of cullet into the chamber so as to form the shower of cullet into a shroud surrounding the flame and to form an annular ridge of heated unmelted cullet on the top surface of the molten glass bath,

heating the shower of cullet while in the shroud by the flame before the cullet falls onto the bath of molten glass, the length of the flame being sufficiently long to heat the cullet in the shroud, and

deflecting the flame upwardly with said ridge when the flame bounces from the bath of molten glass so that the flame does not bounce horizontally and impinge against the near surface of the side walls.

4,539,036

METHOD OF FACILITATING VEGETATION

Stefan Naschberger, Oberau, Austria, assignor to Biochemie Gesellschaft m.b.H., Tyrol, Austria

Filed Feb. 21, 1984, Ser. No. 581,570
Claims priority, application Austria, Feb. 24, 1983, 637/83
Int. Cl.³ C05F 11/08
U.S. Cl. 71—11 **19 Claims**

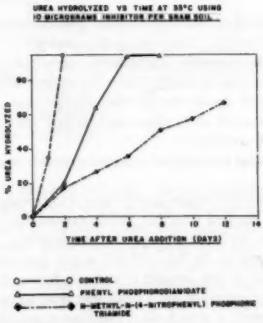
1. A method of facilitating vegetation in soil, comprising applying to said soil a mixture comprising (a) liquid, air-drying 1,3-butadiene homo- or copolymer and (b) a fungal mycelium biomass, whereby said butadiene polymer polymerizes in the presence of oxygen to form a lattice-like, water-permeable non-film polymer.

4,539,037

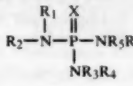
UREASE INHIBITED UREA BASED FERTILIZER COMPOSITIONS CONTAINING N-ARYL-N-ALIPHATIC PHOSPHOROTRIAMIDE COMPOUNDS

Michael D. Swerdloff, Parsippany, N.J.; Michael Van Der Puy, Cheektowaga, N.Y.; Jaroslav F. Kolc, Randolph Township, Dover County; Milorad M. Rogic, Whippany, both of N.J., and Larry L. Hendrickson, Camillus, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 16, 1983, Ser. No. 475,990
Int. Cl.³ C05C 9/00
U.S. Cl. 71—28 **39 Claims**



1. A urease inhibiting composition comprising an acceptable carrier and a urease inhibiting effective amount of one or more phosphorotriamide compounds of the formula:



wherein:

X is oxygen or sulfur;

R_1 is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl or aralkyl;

R_2 is heterocycle, aryl, or aryl substituted with one or more substituents selected from the group consisting of trihalomethyl, alkyl, halo, phenoxy, phenyl, nitro, cyano, amino, alkylamino, dialkylamino, alkoxy, amido, mercapto, alkylmercapto, arylmercapto, alkylcarbonyl, arylcarbonyl, quaternary ammonium radicals, carboxy, alkylcarboxy, carbonamide, isocyano, isocyanato, $(NH_2)_2P(O)O$—, and $(NH_2)_2P(O)NH$—, H_2NSO_2—; and

R_3, R_4, R_5 and R_6 are individually hydrogen or alkyl having from 1 to 4 carbon atoms.

4,539,038

DEVICE ENSURING PERMANENT NUTRITION OF POT PLANTS

Jean-Marie Gombert, Mignaloux-Beauvoir, France, assignor to Airwick AG, Basel, Switzerland

Filed Apr. 25, 1983, Ser. No. 488,247

Claims priority, application Switzerland, Feb. 9, 1982, 5225/82

Int. Cl.³ A01N *25/00*; **A01B** *79/00*

U.S. Cl. 71—64.11 **16 Claims**

1. A plant feeding device comprising a flat support, at least one granulated slow-release fertilizing element selected from the group consisting of nitrogen, phosphorus and potassium releasing materials adhered to the upper face of said support and a water-permeable sheet covering the granules and the flat support so that the granules are enveloped.

4,539,039

HERBICIDAL (-3-FLUORO-5-TRIFLUOROMETHYL-PYRIDYL)OXY PHENYLOXIME DERIVATIVES

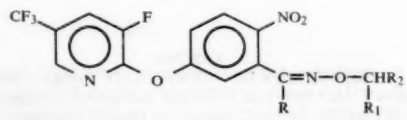
Sudarshan K. Malhotra, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 26, 1984, Ser. No. 604,257

Int. Cl.³ C07D *213/64, 213/70, 213/74*; **A01N** *43/40*

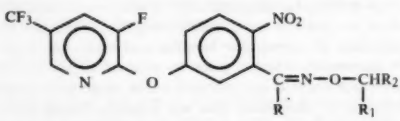
U.S. Cl. 71—94 **6 Claims**

1. A compound having the formula



wherein R and R_1 are independently hydrogen or lower alkyl and R_2 is CO_2Z where Z is lower alkyl.

3. A composition comprising a carrier and a herbicidally effective amount of a compound having the formula



wherein R and R_1 are independently hydrogen or lower alkyl and R_2 is CO_2Z where Z is lower alkyl.

4,539,040

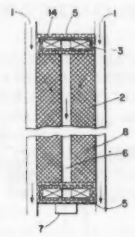
BENEFICIATING ORE BY MAGNETIC FRACTIONAL FILTRATION OF SOLUTES

Osman K. Mawardi, 15 Mornington La., Cleveland Heights, Ohio 44106

Filed Sep. 20, 1982, Ser. No. 420,090

Int. Cl.³ C22B *1/00*

U.S. Cl. 75—1 R **8 Claims**



1. The method of beneficiating ore which comprises the steps of:

a. Dissolving the ore in a solvent to form a mixture of solutes in solution, including a desired solute in this mixture differing in magnetic susceptibility, said desired solute having a relatively high magnetic susceptibility,

b. passing the mixture in a main stream,

c. subjecting the main stream to a lateral high gradient magnetic field at a selected point to form a lateral stream,

d. thereby deflecting from the main stream in the lateral stream at that point, solvent with said desired solute having greater magnetic susceptibility than the solvent with the other solute in the main stream,

e. interposing flow resistance in the lateral stream, whereby the solvent with the said desired solute subjected to lateral magnetic forces overcomes such flow resistance enabling it to continue in the lateral stream and

f. the solvent with the other solute with lower or no magnetic susceptibility, unable to overcome the flow resistance in the lateral stream, remains out of the lateral stream and continues in the main stream and the solvent with the desired solute in the lateral stream is separated from the mixture of solutes obtained from the ore.

4,539,041

PROCESS FOR THE REDUCTION OF METALLIC COMPOUNDS BY POLYOLS, AND METALLIC POWDERS OBTAINED BY THIS PROCESS

Michel Figlarz, Ivry sur Seine; Fernand Fievet, Paris, and Jean-Pierre Lagier, Soisy sur Seine, all of France, assignors to Universite Paris VII, Paris, France

Filed Dec. 20, 1983, Ser. No. 563,621

Claims priority, application France, Dec. 21, 1982, 82 21483

Int. Cl.³ B22F *9/00*

U.S. Cl. 75—0.5 A **15 Claims**

1. A process for reducing in a liquid phase a solid compound, said solid compound being a metal selected from the group consisting of gold, palladium, platinum, iridium, osmium, copper, silver, nickel, cobalt, lead and cadmium in the form of an oxide, hydroxide or salt thereof, comprising heating said compound suspended in a polyol for a time effective to reduce said compound and thereafter isolating the formed metallic precipitate.

4,539,042

PREVENTING AN INCREASE OF THE NITROGEN CONTENT IN MOLTEN STEEL

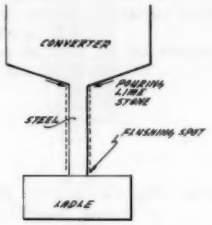
Hans Grüner; Arnold Pfeiffer, both of Duisburg; Heinrich-Wilhelm Rommerswinkel, Muelheim-Saarn, and Rolf Vest, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,439

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1983, 3306782

Int. Cl.[3] C21C 7/00

U.S. Cl. 75—43 7 Claims



1. Method fo preventing the inclusion of nitrogen in molten steel which is treated following a poured discharge from a converter, comprising the steps of protectively enveloping a stream of steel as poured from the converter, with a fine grain material yielding carbon dioxide, the enveloping material reaching a vessel into which the steel is poured simultaneously therewith.

4,539,043

BOTTOM-BLOWN GAS BLOWING NOZZLE

Yoshiharu Miyawaki, Tokyo; Masayuki Hanmyo, Fukuyama; Yusuke Shiratani, Fukuyama; Teruyuki Hasegawa, Fukuyama; Yoichi Nimura, Fukuyama, and Noriyuki Hiraga, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

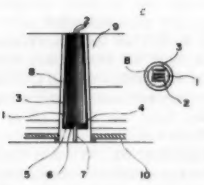
PCT No. PCT/JP83/00098, § 371 Date Nov. 29, 1983, § 102(e) Date Nov. 29, 1983, PCT Pub. No. WO83/03427, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 29, 1983, Ser. No. 556,162

Claims priority, application Japan, Mar. 29, 1982, 57-50545; Mar. 29, 1982, 57-50546; Mar. 29, 1982, 57-50547; Mar. 29, 1982, 57-50548; Mar. 29, 1982, 57-50549; Mar. 29, 1982, 57-50550; Mar. 29, 1982, 57-50551

Int. Cl.[3] C22B 7/16

U.S. Cl. 266—265 10 Claims



1. A bottom-blown gas blowing nozzle for a molten metal refining furnace, comprising a refractory including a plurality of holes having an inner diameter of from 0.5 to 3.0 mmϕ formed through said refractory and extending from a working surface to a back thereof, a metal cover enclosing at least a part of sides of said refractory, and a pressure box formed in a bottom portion of said refractory so as to communicate with said holes and define a gas reservoir space.

4,539,044

ELECTROLESS COPPER PLATING

Magda Abu-Moustafa, Lexington, and Silvester P. Valayil, Shrewsbury, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Continuation of Ser. No. 441,742, Nov. 15, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 650,872

Int. Cl.[3] C23C 3/02

U.S. Cl. 106—1.23 9 Claims

1. An electroless copper plating solution comprising dissolved copper, hydroxide, sufficient complexing agent for the dissolved copper to render the same soluble in alkaline solution and an adduct comprising the reaction product of formaldehyde and a formaldehyde addition agent, said solution having a pH of at least 11 and a molar ratio of each of copper and free formaldehyde to hydroxide varying between 1 to 10 and 1 to 40.

4,539,045

NON-BLOOMING FIRE RETARDANTS FOR WOOD SUBSTRATES

George M. Wagner, Lewiston, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 340,923, Jan. 20, 1982,. This application Dec. 16, 1983, Ser. No. 562,373

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.[3] C09D 5/18

U.S. Cl. 106—18.13 13 Claims

1. A non-blooming fire retardant composition for celulosic material consisting essentially of

(1) a reaction mixture formed from aqueous phosphoric acid and an alkylene oxide of 2 to 4 carbon atoms, the weight ratio of oxide to acid being within the range of about 0.01:1 to about 0.25:1, such ratio being based upon the weight of 100 percent phosphoric acid or equivalent thereof, and

(2) from about 2.5% to about 12% by weight of boric acid on a solids basis.

4,539,046

PRODUCTION OF VERMICULITE PRODUCTS

Kevin T. McAloon; Iona E. Heeson, and Gordon E. Cleaver, all of Cheshire, England, assignors to Imperial Chemical Industries PLC, Great Britain

Filed Dec. 15, 1983, Ser. No. 561,925

Claims priority, application United Kingdom, Feb. 25, 1983, 8305318

Int. Cl.[3] C04B 31/26, 41/28

U.S. Cl. 106—121 16 Claims

1. A process for the production of solid vermiculite products which are stable in water which comprises shaping an aqueous suspension of vermiculite lamellae and removing water from the suspension wherein prior to removal of water from the suspension there is incorporated in the suspension a source of ammonia or ammonium ions and wherein during removal of water from the suspension the shaped suspension is heated at a temperature greater than 100° C. such that ammonia or ammonium ions is liberated within the suspension.

4,539,047

CLEAR COATINGS TO PROTECT WOOD FROM DISCOLORING AND GREYING ON EXTERIOR EXPOSURE

William B. Crockatt, Mississauga, and John Rimma, Scarborough, both of Canada, assignors to DeSoto, Inc., Des Plains, Ill.

Filed Apr. 12, 1984, Ser. No. 599,740

The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.

Int. Cl.³ C08L *91/00*

U.S. Cl. 106—268 **15 Claims**

1. A clear air drying coating composition adapted for the coating of wood to preserve its freshly prepared appearance comprising, a solution of: (1) an unsaturated oil-containing resin in (2) a solvent medium containing at least 50% of mineral spirits, (3) from about 13 to 63 parts of granulated paraffin wax having an average melting point in the range of 50° C.-70° C. per 100 parts of said resin stably dispersed in said solution, and said solution having dispersed therein (4) from 0.5 to 20 parts of a transparent ultraviolet-absorbing pigment per 100 parts of said resin.

4,539,048

ALUMINUM ZIRCONIUM METALLO-ORGANIC COMPLEXES USEFUL AS COUPLING AGENTS

Lawrence B. Cohen, Sharon, Mass., assignor to Jos. Cavedon Company Inc., Woonsocket, R.I.

Filed Feb. 9, 1983, Ser. No. 465,207

The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

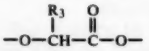
Int. Cl.³ C07F *7/00*

U.S. Cl. 106—287.17 **23 Claims**

17. A composition comprising the product of admixture of: (I) the reaction product of a chelated aluminum moiety, an organofunctional ligand and a zirconium oxyhalide, the organofunctional ligand being complexed with and chemically bound to the chelated aluminum moiety and the zirconium moiety, the aluminum moiety having the formula:

$$Al_2(OR_1O)_aA_bB_c$$

wherein A or B is hydroxy or halogen and a, b and c are numerical values such that $2a+b+c=6$, and (OR_1O) is (a) an alpha, beta or alpha, gamma glycol group in which R_1 is an alkyl group having 1 to 6 carbon atoms or (b) an alpha-hydroxy carboxylic acid residue having the formula:



wherein R_3 is H or an alkyl group having from 1 to 4 carbon atoms; the organofunctional ligand is (1) an alkyl, alkenyl, alkynyl or aralkyl carboxylic acid having from 2 to 6 carbon atoms, (2) an aminofunctional carboxylic acid having from 2 to 6 carbon atoms, (3) a dibasic carboxylic acid having from 2 to 6 carbon atoms, (4) an acid anhydride of a dibasic acid having from 2 to 6 carbon atoms, (5) a mercapto functional carboxylic acid having from 2 to 6 carbon atoms, or (6) an epoxy functional carboxylic acid having from 2 to 6 carbon atoms; and the zirconium oxyhalide moiety has the formula:

$$ZrA_dB_e$$

wherein A and B are as above-defined and d and e are numerical values such that $d+e=4$; the molar ratio of chelated aluminum moiety to zirconium oxyhalide moiety being from about 1.5 to 10, and the molar ratio of organofunctional ligand to total metal being from about 0.05 to 2, and

(II) a filler selected from the group of glass, silica, calcium carbonate, alumina trihydrate, aluminum silicate, talc, wollastonite, mica, titanium dioxide, and an organic particulate having reactive groups.

4,539,049

ALUMINUM ZIRCONIUM METALLO-ORGANIC COMPLEX USEFUL AS COUPLING AND HYDROPHOBIC AGENTS

Lawrence B. Cohen, Sharon, Mass., assignor to Jos. Cavedon Co., Inc., Woonsocket, R.I.

Continuation-in-part of Ser. No. 465,207, Feb. 9, 1983. This application Mar. 22, 1983, Ser. No. 478,043

Int. Cl.³ C07F *7/00*

U.S. Cl. 106—287.17 **24 Claims**

23. The composition of claim 22, wherein the inorganic filler comprises glass fibers said composition having been formed in an organic solvent in the substantial absence of water.

4,539,050

PROCESS FOR THE MANUFACTURE OF SEMICONDUCTOR WAFERS WITH A REAR SIDE HAVING A GETTERING ACTION

Josef Kramler, Burgkirchen; Franz Kuhn-Kuhnenfeld, Emmerting, and Hans-Adolf Gerber, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft Für Elektronik-Grundstoffe m.b.H., Burghausen, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,411

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246480

Int. Cl.³ H01L *21/268*

U.S. Cl. 148—1.5 **12 Claims**

1. A process for the manufacture of semiconductor wafers with a rear side having a gettering action by the action of light radiation so as to induce a gettering dislocation network in subsequent high-temperature processes, comprising the steps of:

selecting semiconductor wafers each having a rear side that contains in its fine surface structure faces that are inclined by at least 15° with respect to the geometrically ideal surface of the wafer; and

melting parts of the rear sides of said wafers by the action of light radiation so as to induce a gettering dislocation network in the surface region of the rear side of the wafers, the incident energy density of said light radiation employed in said melting step being 20 to 80% of the energy density that is necessary for producing a similarly dense dislocation network in a mirror-polished surface of a wafer.

4,539,051

PROCESS FOR PRODUCING PHOSPHATE COATINGS

Kenneth J. Hacias, Sterling Heights, Mich., assignor to Parker Chemical Company, Madison Heights, Mich.

Continuation-in-part of Ser. No. 469,621, Mar. 2, 1983, abandoned. This application Jan. 10, 1985, Ser. No. 690,431
Int. Cl.[3] C23C *1/10*; C25D *13/00*
U.S. Cl. 148—6.15 Z 27 Claims

1. An improved process for phosphating metal surfaces which comprises the steps of providing an activating composition comprising a mixture of about 60% to about 90% by weight of a particulated dried reaction product of a titanium-containing compound and a sodium phosphate compound containing at least about 0.005% by weight titanium and the balance comprising tetrasodium pyrophosphate, dispersing said activating composition in water at a concentration of about 0.1 to about 10 g/l to provide an activating solution, contacting a clean metal surface with said activating solution at a pH of about 7 to about 10 for a period of time of at least about 15 seconds to provide an activated metal surface, contacting the activated metal surface with an aqueous high-zinc phosphating solution for a period of time to produce a desired thickness of a zinc phosphate coating thereon, rinsing the zinc phosphate coating with a dilute aqueous solution containing chromium ions, and thereafter applying an electrophoretic organic coating to the rinsed zinc phosphate coating.

4,539,052

METHOD FOR MAKING A COMPOSITE CATHODE ACTIVE MATERIAL/CURRENT COLLECTOR PRODUCT

David N. Palmer, Tolland, and Gary W. Ferrell, Collinsville, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 464,069, Feb. 4, 1983, abandoned. This application Apr. 16, 1984, Ser. No. 600,355
Int. Cl.[3] B05D *5/12*
U.S. Cl. 148—6.24 9 Claims

1. A method for making a composite cathode active material/current collector product which comprises the following steps:

(a) heating a transition metal wire having a minimum diameter of 0.1 cm under a vacuum of about 1×10^{-6} torr and then contacting the wire with an approximately stoichiometric amount of a vapor of a chalcogen or of a vapor of a hydrogen chalcogenide at a temperature of from about 500° C. to about 1000° C. and at a vapor pressure of from about 0.3 atmosphere to about 3 atmospheres for from about 4 hours to about 63 hours;

(b) removing any unreacted vapor;

(c) cooling the wire to room temperature;

(d) packing the wire with excess chalcogen and providing a vacuum of about 1×10^{-6} torr around the packed wire;

(e) raising the temperature of the packed wire at a rate of about 10°–25° C. per minute to a temperature of from about 450° C. to about 1000° C. and holding said temperature for from about 8 hours to about 48 hours; and

(f) cooling the wire to room temperature under its own thermal inertia;

whereby there is formed a wire having a conductive interior portion of a transition metal capable of serving as a current collector and having an exterior portion of an intercalatable layered transition metal chalcogenide extending inwardly toward the interior portion over a distance of from about 10% to about 45% of the wire diameter capable of serving as a cathode active material.

4,539,053

PACK COMPOSITION FOR CARBUROSILICONIZING FERROUS SUBSTRATES

William L. Aves, Jr., Arlington, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 547,184, Oct. 31, 1983, Pat. No. 4,495,005. This application Aug. 27, 1984, Ser. No. 644,464
Int. Cl.[3] C21D *1/06*
U.S. Cl. 148—19 5 Claims

1. A pack composition for treating a ferrous metal to initially diffuse carbon into the surface thereof and subsequently diffuse boron and silicon consisting essentially of:

(a) between about 5% and 20% by weight amorphous boron;

(b) between about 2% and 10% by weight silicon material;

(c) between about 2% and 15% by weight alkali earth; and

(d) between about 70% and 90% by weight carbon bearing compound, said carbon bearing compound consisting essentially of

(1) between about 5% and 45% by weight barium carbonate;

(2) between about 5% and 20% weight calcium carbonate;

(3) between about 50% and 90% by weight hardwood charcoal and coke mixture, said hardwood charcoal and coke mixture comprising:

(i) between about 70% and 90% by weight hardwood charcoal; and

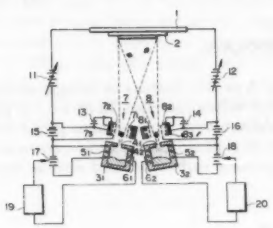
(ii) between about 5% and 20% by weight coke.

4,539,054

AMORPHOUS FILM OF TRANSITION ELEMENT-SILICON COMPOUND

Kiyoshi Morimoto, Mobara, and Toshinori Takagi, Nagaoka-kyo, both of Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed May 2, 1983, Ser. No. 490,535
Claims priority, application Japan, Apr. 30, 1982, 57-71419
Int. Cl.[3] C22C *28/00*
U.S. Cl. 148—403 6 Claims



1. An amorphous film composed of a transition element-silicon compound which consists essentially of iron and silicon, wherein the content of said silicon is within the range of 60 atom percent through 85 atom percent, whereby said amorphous film contains a ζ-$FeSi_2$ phase that is semiconductive.

4,539,055

FIBER PIPE PROTECTION FOR WATER COOLED PIPES IN REHEAT FURNACES

Donald R. Orcutt, Hanover Park, Ill., assignor to The Babcock & Wilcox Company, New Orleans, La.

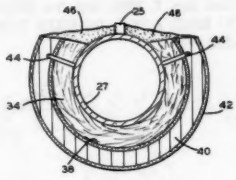
Division of Ser. No. 389,722, Jun. 18, 1982, Pat. No. 4,450,872. This application Mar. 15, 1984, Ser. No. 589,819
Int. Cl.[3] F27D *9/00, 3/02*; B32B *7/08, 31/00*
U.S. Cl. 156—92 2 Claims

1. A method for insulating a water cooled member forming a structural portion of a furnace comprising:

(a) covering the water cooled member with a layer of fibrous thermal insulation ceramic blanket;

(b) wrapping a clotch of an open weave type around the ceramic blanket;
(c) applying a veneering mortar on the cloth, such that the mortar penetrates into the fibers of the ceramic blanket;
(d) disposing ceramic blanket rings about and contacting the veneering mortar; and
(e) applying a veneering coating to the rings.

2. A method for insulating a skid pipe in a furnace comprising:
(a) attaching anchors to the skid pipe;



(b) impaling a ceramic blanket over the anchors;
(c) impaling an open weave type cloth over the anchors;
(d) applying a veneering mortar on the cloth, such that the mortar penetrates into the fibers of the ceramic blanket;
(e) wrapping strips of ceramic fiber about the veneering mortar;
(f) applying a layer of veneering coating to the strips; and
(g) filling in gaps which occur on either side of a skid rail with a refractory mortar.

4,539,056

RELEASE SHEET AND A METHOD FOR MAKING THEREOF

Kazuhisa Takeshita, Yokohama, and Yasuo Takeda, Tokyo, both of Japan, assignors to Ajinomoto Co., Inc. and Nippon Printing Co., Ltd., both of, Japan

Filed Dec. 8, 1983, Ser. No. 559,312
Claims priority, application Japan, Dec. 13, 1982, 57-216895
Int. Cl.³ B31F *1/12*; B05D *5/00*; D06N *7/04*
U.S. Cl. 156—183 **17 Claims**

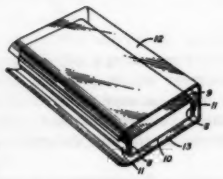
1. A release sheet for use in making synthetic leather, which comprises a release resin layer having a first surface on which an embossed pattern complementary to wrinkles, pores and the like inherent in natural leather is formed and a second surface to which a backing sheet and a pattern layer are adhered.

4,539,057

METHOD FOR PRODUCING AN ELASTIC BODY WITH PROTECTIVE LAYER

Lars Ahlm, Källgatan 10, S-523 00 Ulricehamn, Sweden

Division of Ser. No. 391,688, Jun. 24, 1982, Pat. No. 4,440,817. This application Mar. 15, 1984, Ser. No. 589,725
Claims priority, application Sweden, Jul. 3, 1981, 8104154
Int. Cl.³ B29C *17/04*
U.S. Cl. 156—212 **5 Claims**



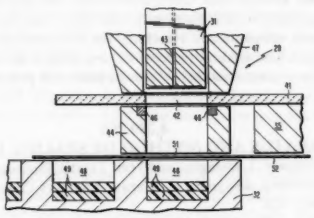
1. A method for producing an integrated elastic body of increased noise suppression comprising a predominantly open cell foam plastic core having upper and lower surfaces, longitudinal surfaces and transverse surfaces, and an outer nonpermeable plastic layer overlying and secured to said core, comprising the steps of:
(A) positioning an inner, noise suppressing fabric layer overlying said upper and lower surfaces and said longitudinal surfaces of said core;
(B) adhering said fabric layer to said core over at least a portion of the surface of said core;
(C) positioning said outer layer overlying said adhered inner layer and adjacent said upper and lower surfaces and said longitudinal surfaces of said core; and
(D) adhering said outer layer to said inner layer and said core over at least a portion of the surface of said core, thereby forming said integrated elastic body.

4,539,058

FORMING MULTILAYER CERAMIC SUBSTRATES FROM LARGE AREA GREEN SHEETS

Allan C. Burgess, Yorktown Heights; Robert A. Magee, and George E. Melvin, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,099
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—250 **10 Claims**



1. A method of forming a multilayer ceramic substrate comprising the steps of:
fabricating an array of layer sites on a large area ceramic green sheet, each layer site comprising a plurality of conductive vias interconnected with a surface conductive pattern, the area of said ceramic green sheet being sufficiently large to preclude alignment of corresponding vias on superimposed large area ceramic green sheets;
aligning a reference mark on one of said layer sites with respect to a die cavity by determining the dimensional offset of said reference mark from its nominal position and indexing said layer site with respect to said die cavity with said dimensional offset being applied such that said reference mark lies a predetermined distance from the edge of said die cavity;
punching the aligned individual layer site into said die cavity;
repeating said aligning and punching steps to stack a plurality of aligned and punched layer sites; and
laminating the stacked plurality of aligned and punched layer sites to form a multilayer ceramic substrate;
whereby the vias in the stacked layer sites are aligned notwithstanding the dimensional distortion of layer sites with respect to one another on said large area ceramic green sheet.

4,539,059

METHOD OF MANUFACTURING CORROSION-RESISTANT MEASURING PROBES

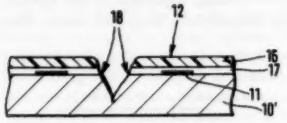
Kurt Burger, Friolzheim, and Heinz Friedrich, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,975

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1982, 3231345

Int. Cl.[3] **B32B** *31/00;* **B29C** *19/02;* **C09J** *5/02;* **B23K** *9/00*

U.S. Cl. 156—251 **3 Claims**



1. A method of manufacturing a measuring probe of the type having a rigid support, a system of measuring layers arranged on the support, and a protective foil sealingly covering the measuring layers to protect the same against aggressive environment, comprising the steps of arranging a plurality of measuring layer systems on a large-area support; providing a large-area protective foil with a lower layer of thermoplastic material; then coating the layer systems, with the protective foil; then cutting with a laser beam a thus-formed multi-layer structure including the support, the measuring layer systems arranged on the support, and the protective foil, so that the laser beam simultaneously separates the individual measuring probes from one another and hermetically seals the edges of the separated protective foil portions to the upper surface of the support; and subsequently attaching the foil portions to the support by a heat-sealing process during which the foil portions are subject simultaneously both to heat and pressure.

4,539,060

APPARATUS AND METHOD OF SEALING CAPSULES

Fritz Wittwer, Lupsingen, and Ivan Tomka, Bourguillon, both of Switzerland, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 18, 1983, Ser. No. 468,022

Int. Cl.[3] **C09J** *27/02*

U.S. Cl. 156—275.1 **15 Claims**

1. A method for sealing gelatin capsules having hard shell coaxial cap and body parts which overlap when telescopically joined, comprising the steps of:

A. dipping the capsules in a sealing fluid making contact by capillary action within the overlap of the cap and body parts;

B. removing the sealing fluid from the surface of the capsules; and

C. applying thermal energy locally for about two seconds to the overlap so as to cause peptization or denaturation of the gelatin and sealing fluid within the overlap, thereby causing a sealing together of the cap and body parts.

4,539,061

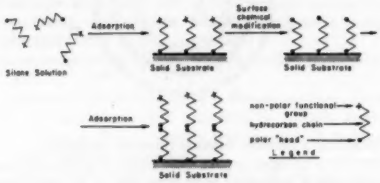
PROCESS FOR THE PRODUCTION OF BUILT-UP FILMS BY THE STEPWISE ADSORPTION OF INDIVIDUAL MONOLAYERS

Jacob Sagiv, Rehovot, Israel, assignor to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Sep. 7, 1983, Ser. No. 530,102

Int. Cl.[3] **B05D** *1/36, 7/00;* **B32B** *7/04, 31/00*

U.S. Cl. 156—278 **15 Claims**



1. A process for the production of a plurality of monolayer structures one on the other, which comprises forming on a suitable substrate a compact ordered monolayer of molecules selected from the group consisting of molecules having an elongated configuration and molecules having a flattened configuration, with at least one functional group adapted to be attached to the substrate at one end or side, respectively, of the molecule, and at least one non-polar group at another position along said molecule, converting, after formation of said monolayer, said non-polar groups to polar functional groups which are of a reactive nature and continuing the formation of further layers until the desired number of layers is obtained.

4,539,062

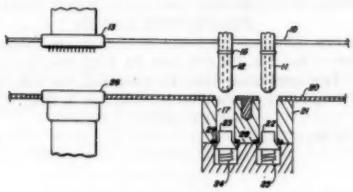
MODULAR PLASMA REACTOR WITH LOCAL ATMOSPHERE

John P. Zajac, San Jose, Calif., assignor to Tegal Corporation, Novato, Calif.

Filed Mar. 12, 1984, Ser. No. 588,853

Int. Cl.[3] **H01L** *21/306;* **C23F** *1/00*

U.S. Cl. 156—345 **4 Claims**



1. In equipment for processing semiconductor wafers with a plasma, said equipment including as components a reactor chamber, one or more gas supply lines associated with said chamber, an electronic control unit, and a plurality of transducers coupled to said control unit, the improvement comprising:

a plurality of modules for containing at least some of said components;

a plenum for containing an inert atmosphere; and

said modules being coupled to said plenum so that said atmosphere flows through and around said module.

4,539,063

APPARATUS FOR THE TRANSFER OF PRINT DESIGNS

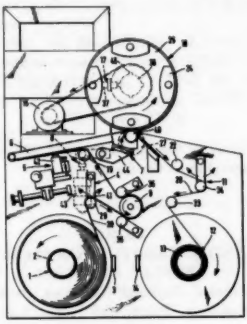
Robert Cué, Grosszimmern, and Alfred Hagemann, Hochheim am Main, both of Fed. Rep. of Germany, assignors to Akerlund & Rausing Verpackung GmbH, Hochheim am Main, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,167

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 3149950; European Pat. Off., Nov. 10, 1982, 82110357.9

Int. Cl.[3] B32B *31/00;* B44C *1/00;* B65H *25/02*

U.S. Cl. 156—361 27 Claims



1. In a device for transferring a print design under heat action from a carrier band onto an object, wherein the carrier band is transported from a tape dispensing roll past a scanning device and a preheating device by a drive roller driven by a band drive motor, and then through a transfer zone to a band take-up roll, and wherein in each case the object to be provided with a print design is conveyed by a transport arrangement provided with holding means so that a surface of the object for receiving the print design passes into the transfer zone, where the print design in each case is transferred under pressure and heat from the moved carrier band onto the moving surface of the object, an improvement comprising:

said band drive motor for said drive roller of said carrier band being constructed as a step motor;

a transport drive motor for bringing about movement of the surface of the object;

electrical means for synchronization of said band drive motor with said transport drive motor;

said electrical means including a pacer allocated to said transport drive motor;

first means for conveying said carrier band backwards from said transfer zone after a particular print design is transferred onto the surface of the object during forward movement of the carrier band;

a scanning arrangement including said scanning device being arranged between said tape dispensing roll and said transfer zone; and

said scanning arrangement including second means for detecting a control mark provided on said carrier band for stopping said first means from conveying said carrier band backwards so that said carrier band is set on a starting position for its next transfer operation.

4,539,064

APPARATUS FOR SPLICING STRIPS OF THERMOPLASTIC MATERIAL

Roman Andruchiw, 137 Spring Garden Ave., Willowdale, Ontario, Canada (M2N 3G6); David C. Cordingley, 3 Clearside Pl., Elobicoke, Ontario, Canada M9C 2G5, and Mark T. Loughborough, 79 Isle of Venice, Fort Lauderdale, Fla. 33301

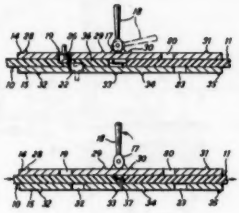
Continuation of Ser. No. 314,377, Oct. 23, 1981, abandoned.

This application Apr. 6, 1984, Ser. No. 597,193

Claims priority, application Canada, Oct. 24, 1980, 363235

Int. Cl.[3] B32B *19/02*

U.S. Cl. 156—379.7 2 Claims



1. Apparatus for use in the splicing of the ends of a pair of elongated strips of thermoplastic material, said strips having a like uniform cross-section and being formed with longitudinally extending serrations on opposite sides thereof comprising:

trimming means for forming complementary surfaces at said ends such that when said ends are caused to move into an abutting relationship, substantially the entire said surfaces thereof are in contact with each other and the serrations of one of said strips are in longitudinal alignment with the serrations of the other said strip during the splicing operation;

means for softening the thermoplastic material at the abutting ends thereof so as to weld said ends together, said means for softening being electronic, conducting mesh means positioned between the end faces of said elongated strips through which electronic current is passed in order to heat and thereby soften the thermoplastic material at the abutting ends, said mesh means remaining embedded in said joined ends; and

a pair of complementary upper and lower clamping members providing opposed complementary clamping faces conforming to the configuration of the configuration of the sides of said strips and having means for releasably securing said clamping members in clamped relationship in order to maintain said ends in abutting relationship therebetween, said clamping faces being in substantially continuous contact with the area of the sides of the strips at and adjacent to said abutting ends in order to constrain the softened thermoplastic material between said abutting ends such that the abutting ends have substantially the same configuration as the sides of said strips adjacent thereto said upper claming member having a first pair of parallel transverse slots, each of which define a step, said lower clamping member having a second pair of parallel transverse slots, each of which define a step, said second pair of slots being offset from the first pair of slots by a distance less than their width, said trimming means comprisng a routing tool having a cutter which is engageable with said strips through the slots for routing tranverse grooves therein, said routing tool having a stop member engageable with said steps for limiting the grooves to one-half the thickness of the strips.

4,539,065

APPLICATION OF SURFACING SHEETS TO SUPPORT MEMBERS THEREFOR

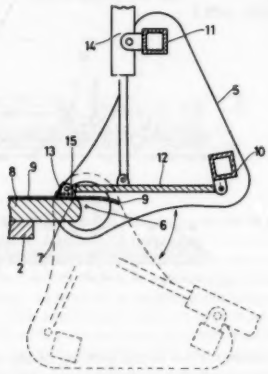
Karl-Heinz Schmitt, 122 Pretoria Rd., Rynfield, Benoni Tvl. Province, South Africa

Filed May 8, 1984, Ser. No. 608,095

Claims priority, application South Africa, May 9, 1983, 83/3280

Int. Cl.[3] B29C *17/00*

U.S. Cl. 156—475 8 Claims



1. Apparatus for applying sheet material around an edge or corner of a carrier member, said apparatus comprising a frame, a support arrangement for the carrier member for supporting it in a predetermined position, a pair of end supports rotatable in unison, a pair of laterally offset primary frame members extending between and attached to the two end supports, an applicator bar extending along the required length of the support arrangement, means carried by one of said primary frame members for urging the applicator bar towards the surface of a carrier member supported by the apparatus, and away from said primary frame member, means for causing rotation of said end supports which causes lateral movement of the applicator bar relative to said surface while remaining in contact therewith, and lateral restraining means carried by the other primary frame member for inhibiting uncontrolled or undesired lateral movement of the applicator bar.

4,539,066

APPLICATION OF SURFACING SHEETS TO PANELS, COLUMNS AND THE LIKE

Pieter M. Henderson, 10 Beech Rd., Bedfordview, Tvl. Prov., and Karl-Heinz Schmitt, 122 Pretoria Rd., Rynfield, Benoni, Tvl. Prov., both of South Africa

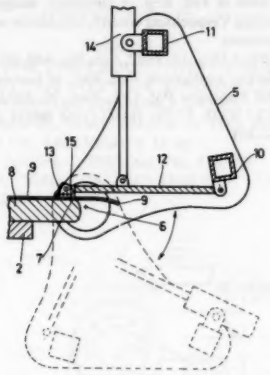
Filed May 8, 1984, Ser. No. 608,206

Claims priority, application South Africa, Jun. 7, 1983, 83/4929

Int. Cl.[3] B32B *17/04*

U.S. Cl. 156—479 13 Claims

1. Apparatus for applying sheet material around an edge or corner of a carrier member, said apparatus comprising a frame, a support arrangement for the carrier member for supporting it in a roughly predetermined position relative to the frame of the apparatus, an applicator bar associated with the frame and extending along the required length of the support arrangement, means for urging the applicator bar towards the surface of a carrier member supported in the apparatus, means for causing simultaneous lateral movement of the applicator bar relative to said surface whilst in contact therewith and lateral restraining means for inhibiting uncontrolled or undesired



lateral movement of the applicator bar, the support arrangement being movable to the frame.

4,539,067

METHOD AND APPARATUS FOR MANUFACTURING SINGLE CRYSTALS

Syoichi Washizuka; Jisaburo Ushizawa, both of Yokohama; Yoshihiro Kokubun, Tokyo, and Tsuguo Fukuda, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

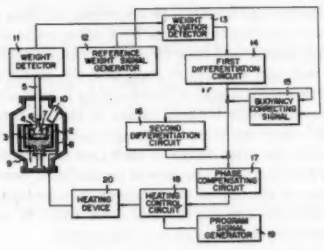
Division of Ser. No. 336,708, Jan. 4, 1982, Pat. No. 4,397,813.

This application Jun. 27, 1983, Ser. No. 508,091

Claims priority, application Japan, Jan. 17, 1981, 56-4596

Int. Cl.[3] C30B *15/28*

U.S. Cl. 156—601 4 Claims



1. A method for manufacturing single crystals comprising:

a first step of pulling a single crystal from a melt within a vessel holding a melt and a liquid encapsulant;

a second step of measuring a weight of the single crystal pulled in said first step;

a third step of comparing a weight signal obtained in said second step with a reference weight signal to provide a weight deviation signal;

a fourth step of differentiating the weight deviation signal obtained in said third step;

a fifth step of converting a buoyancy of said liquid encapsulant influencing the single crystal pulling into a weight-/time signal corresponding thereto and outputting the weight/time signal as a buoyancy correction signal;

a sixth step of subtracting the buoyancy correction signal obtained in said fifth step from a differentiation output signal obtained in said fourth step to provide a signal

corresponding to a true diameter fluctuation of the single crystal;

a seventh step of differentiating the signal obtained in said sixth step;

an eighth step of adding a differentiation output signal obtained in said seventh step and the signal obtained in said sixth step;

a ninth step of generating a heating control signal for the melt in response to the signal obtained in said eighth step; and

a tenth step of heating the solution in response to the heating control signal obtained in said ninth step.

4,539,068

VAPOR PHASE GROWTH METHOD

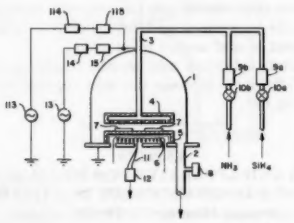
Mikio Takagi, Kawasaki; Kanetake Takasaki, Tokyo, and Kenji Koyama, Yokosuka, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 264,805, May 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 184,363, Sep. 5, 1980, abandoned. This application Aug. 27, 1982, Ser. No. 412,260

Claims priority, application Japan, Sep. 20, 1979, 54-121489

Int. Cl.[3] **C30B** *25/02*

U.S. Cl. 156—614 **3 Claims**



1. A method of plasma chemical vapor deposition for forming a film on a substrate, comprising the steps of:

disposing the substrate in a reaction chamber having a pair of electrodes;

introducing reactive gases into the reaction chamber; and

simultaneously applying a plurality of electric power sources of different frequencies to the pair of electrodes to excite the reactive gases which are transformed into a plasma, the plurality of electric power sources of different frequencies including a first electric power source having a first frequency and a second electric power source having a second frequency, the first frequency providing a high deposition rate relative to the second frequency, the second frequency producing a reduced number of pinholes in the film relative to the first frequency; and

depositing the film, having the reduced number of pinholes, on the substrate from the plasma generated by simultaneously applying the plurality of electric sources of different frequencies.

4,539,069

PRINTED CIRCUIT BOARD COMPONENT CONVEYOR APPARATUS AND PROCESS

Herbert Fishman, Newton Center, and Alvin J. Rogers, Brockton, both of Mass., assignors to Systems Engineering & Manufacturing Corp., Stoughton, Mass.

Continuation of Ser. No. 455,956, Jan. 6, 1983, Pat. No. 4,454,003. This application Dec. 19, 1983, Ser. No. 562,825

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

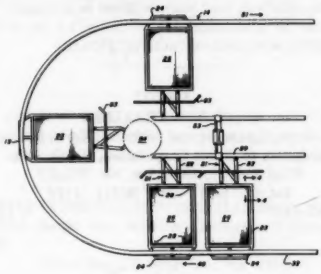
Int. Cl.[3] **H01L** *21/306;* **C23F** *1/02*

U.S. Cl. 156—640 **8 Claims**

1. A printed circuit board conveyor apparatus comprising a spray treatment line for moving a substantially planar circuit board component having first and second sides along a first path from a starting point to a distant point,

said apparatus comprising a frame means for mounting said circuit board component for movement away from said starting point along said first path to said distant point,

said frame means extending so as to support each said component in a substantially vertical plane with a component being mounted on each frame means and each frame means comprising a blade means for engaging a guide rail in sliding contact therewith to maintain movement of said frame in a plane,



liquid spray means positioned on either side of said path for uniformly spraying said circuit board sides with liquid to carry out a printed circuit processing step,

conveyor guide means for contacting said frame means in supporting relationship therewith to maintain a predetermined position of the frame and fixed position of said circuit board mounted thereon to aid in uniform application of liquids by said liquid spray means, and

a conveyor drive means mounting said frame means for moving said circuit board in said first path.

4,539,070

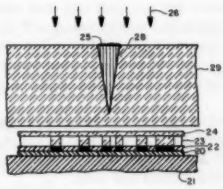
EXPOSURE OF PHOTO RESIST

Richard Jarocinski, Wood Dale; William R. Keaton, Genoa, and Joseph L. Magennis, Bensenville, all of Ill., assignors to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Dec. 21, 1983, Ser. No. 563,837

Int. Cl.[3] **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—659.1 **2 Claims**



1. A method of reducing the production of defective circuit boards due to the presence of minute opaque particles that may settle onto the cover surface of an assembly of a mask, a resist and a metal substrate prior to exposing said resist to radiation including the step of placing a second cover sheet over said assembly of a thickness sufficient to permit the diffusion of any shadows produced by minute particles resting on the cover surface.

4,539,071

BIOCIDE

Richard P. Clifford, South Wirral, and Gerrard A. Birchall, Rainford, both of England, assignors to Dearborn Chemicals Limited, Widnes, England

Filed Apr. 18, 1983, Ser. No. 486,007

Claims priority, application United Kingdom, Apr. 19, 1982, 8211229

Int. Cl.³ D21D *3/00*

U.S. Cl. 162—161 **21 Claims**

1. A method for the treatment of a cooling water system or of a water system used in paper making to inhibit baterial growth and slime formation which comprises adding to the water glutaraldehyde and isothiazolone in a weight ratio of isothiazolone to glutaraldehyde of from 1:1 to 1:10 in an amount sufficient to control bacterial growth.

4,539,072

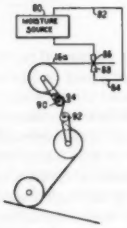
CURL NEUTRALIZER

Kenneth G. Frye, Egremont, and Arthur T. Karis, Lenox, both of Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Jan. 31, 1984, Ser. No. 575,655

Int. Cl.³ D21F *7/00*; B65H *23/34*

U.S. Cl. 162—197 **12 Claims**



1. An automatic decurling apparatus for a web of paper material comprising:

a first roll mounted on an axle for carrying the web of paper, the web wrapping around said first roll with a first side engaging said roll,

a second roll mounted on an axle downstream of said first roll for carrying the web of paper, the web wrapping around said second roll with a second side engaging said second roll,

a first decurling bar carried in a mounting block,

a first pivot arm carrying said mounting block at one end, said pivot arm being pivotally connected intermediate its ends to said first roll axle,

a link member pivotally connected to an end of said pivot arm opposite the end carrying said mounting block,

means for adjusting the position of said link member to effect pivotal movement of said first pivot arm permitting selective adjustment of said first decurling bar into one of said sides of the paper in a portion of the web between said two rolls,

a second decurling bar carried in a mounting block,

a second pivot arm carrying said mounting block at one end, said pivot arm being pivotally connected intermediate its ends to said second roll axle,

a link member pivotally connected to end of said second pivot arm opposite the end carrying said mounting block,

means for adjusting the position of said link member to effect pivotal movement of said second pivot arm permitting independent selective adjustment of said second decurling bar into a side of the web opposite the side engaged by the first decurling bar,

whereby, said first and second decurling bars can be adjusted independently and simultaneously into opposite sides of the web between said two rolls.

9. The method of removing curl from a web of paper comprising the steps:

mounting a first roller on an axle for carrying the web of paper,

wrapping the web around said first roller with a first side engaging said roller,

mounting a second roller on an axle downstream of said first roller for carrying the web of paper,

wrapping the web around said second roller with a second side engaging said second roller,

mounting a first decurling rod in a mounting block,

attaching said mounting block at a first end of a pivot arm,

pivotally connecting said pivot arm intermediate its ends to said first roller axle,

pivotally connecting a link member to said pivot arm at an opposite the end carrying said mounting block,

adjusting the position of said link member to effect pivotal movement of said first pivot arm to adjust said first decurling rod into one of said sides of the paper web in a portion of the web between two rollers,

mounting a second decurling rod in a mounting block,

attaching said mounting block at one end of a second pivot arm,

pivotally connecting said second pivot arm intermediate its ends to aid second roll axle,

pivotally connecting a link member to an end of said second pivot arm opposite the end carrying said mounting block,

adjusting the position of said link member to effect pivotal movement of said second pivot arm,

independently adjusting said second decurling rod into a side of the web opposite the side engaged by the first decurling rod.

4,539,073

METHOD AND APPARATUS FOR MEASURING THE SIZE OF A DISCHARGE SLOT IN A HEADBOX

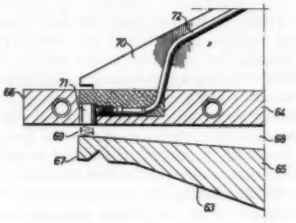
Anders I. Andersson, Hammarö , Sweden, assignor to KMW Aktiebolag, Karlstads, Sweden

Filed Sep. 28, 1982, Ser. No. 426,104

Claims priority, application Sweden, Dec. 1, 1981, 8107155

Int. Cl.³ D21F *1/02*

U.S. Cl. 162—198 **22 Claims**



1. A method for directly measuring, during the operation of a paper machine, the distance between two structural members positioned in opposed spaced apart relation to one another and defining a stock discharge slot therebetween, said method comprising transmitting an ultrasonic pulse from one of the structural members through the stock passing between the cooperating structural members and to the oppositely positioned structural member, and measuring the travel time of the ultrasonic pulse across the slot, from which can be determined the distance between said structural members.

7. Apparatus for directly measuring the distance across the stock discharge slot of a paper machine during the operation of the paper machine, said apparatus comprising stock-delivering means including a pair of cooperating structural members positioned in opposed spaced apart relation and defining a stock discharge slot therebetween, ultrasonic transducer means

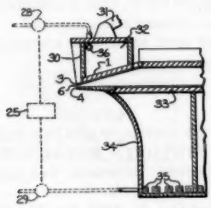
mounted in one of said structural members and arranged to transmit an ultrasonic pulse through the stock passing between said cooperating structural members and to the oppositely positioned structural member, and an electronic measuring unit connected to said ultrasonic transducer means and operable to measure the travel time of the ultrasonic pulse across the slot defined between said structural members, from which can be determined the distance between said structural members.

4,539,074

METHOD AND APPARATUS FOR DETECTING AND COUNTERACTING A DEFORMATION OF THE STOCK DISCHARGE GAP IN A HEADBOX OF A PAPER MACHINE

Erik G. Stenberg, Gillbergsgatan, Sweden, assignor to KMW Aktiebolag, Karlstad, Sweden

Filed May 15, 1984, Ser. No. 610,330
Claims priority, application Sweden, May 27, 1983, 8302987
Int. Cl.³ D21F *11/00*
U.S. Cl. 162—198 **13 Claims**



1. A method for detecting and counteracting deformation of a stock discharge gap defined between an apron beam member and a cooperating roof member in the headbox of a paper machine comprising:

(a) ultrasonically measuring the stock discharge gap between the apron beam member and the roof member at at least two locations along the length of the stock discharge gap;

(b) obtaining the difference between the measurement results for at least two locations along the length of the stock discharge gap; and

(c) adjusting the temperature of at least one of said apron beam member and roof member in response to the obtained difference in measurement results so as to reduce the magnitude of any deformation in the stock discharge gap.

4,539,075

PERFORATED SHEET FOR THE HEAD BOX OF A PAPER MACHINE

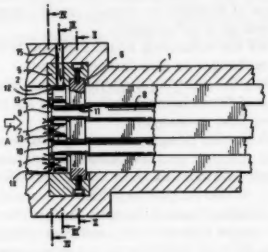
Pekka Majaniemi, Pirkkala, Finland, assignor to Oy Tampella AB Lapintie, Tampere, Finland

Filed Dec. 19, 1983, Ser. No. 563,031
Claims priority, application Finland, Jan. 4, 1983, 830016
Int. Cl.³ D21F *1/02*
U.S. Cl. 162—343 **6 Claims**

1. A perforated sheet for a head box of a paper machine, comprising several rod elements each including a flow passage, said flow passages arranged in parallel into an integrated package and starting from a common front face of said perforated sheet and having inlet openings;

said rod elements each being integrally formed with a feeding duct, said feeding ducts being substantially parallel to said front face of said perforated sheet and being connected to a source of flushing liquid to feed said flushing liquid through said feeding ducts; and

said rod elements each being integrally formed with a flushing duct, said flushing ducts connecting said feeding ducts



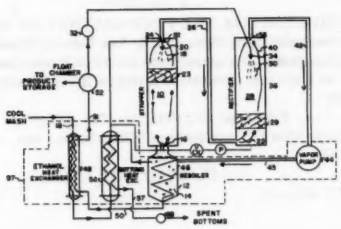
to said front face, and terminating in said front face at points between said inlet openings of said passages.

4,539,076

VAPOR COMPRESSION DISTILLATION SYSTEM

R. L. Bibb Swain, 104 William Claiborne, Williamsburg, Va. 23185

Filed Sep. 27, 1982, Ser. No. 424,047
Int. Cl.³ B01D *3/42, 1/28*
U.S. Cl. 202—154 **23 Claims**



1. A distillation system comprising:

a stripper column arranged for the introduction of hot feed liquid into the top and vapor into the bottom, said stripper column having an outlet means at its top for eszcape of exiting vapors and an inlet means at its bottom for the entrance of said vapor;

a reboiler unit positioned below said stripper column and coupled to said inlet means, said reboiler containing liquid and comprising heating means for producing vapor from said liquid;

a rectifier column for enriching the vapor which exited the stripper column, the bottom of said rectifier column comprising inlet means for said vapor, and the top of said rectifier column comprising means for outlet of the enriched vapor and inlet of liquid reflux;

a first line for transmitting vapor from the top of the stripper column to the bottom of the rectifier column;

a vapor pump for increasing the pressure and temperature on said enriched vapor;

a second line for transmitting said enriched vapor from the top of said rectifier column to said vapor pump;

a third line for transmitting said hot compressed enriched vapor from said vapor pump to the top of said reboiler and continuing through said reboiler to an exit at the bottom of said reboiler;

a distillate heat exchanger for cooling the distillate liquid and heating the incoming feed liquid;

a fourth line in continuation of said third line connecting the

bottom of said reboiler with said distillte heat exchanger in counterflow direction to said incoming liquid feed;

a float chamber to amintain the desired backpressure on the system back to said vapor pump, to divert the proper amount of distillate to storage, and to provide a pressurized source of relux liquid;

a fifth line for conduting liquid distillate from said distillate heat exchanger to said float chamber;

a sixth line for carrying a portion of said distillate as reflux from said float chamber to the top os adi rectifier column;

a bottoms heat exchanger;

a seventh line for bringing incoming cool feed liquid into the system through said distillate heat exchanger continuing through said bottoms heat exchanger and connecting to the top of said stripper column for warming feed liquid in said distillate heat echanger, further heating said feed liquid in said bottoms heat exchange, and introducing said hot liquid feed into the top of said stripper column;

an eighth line for carrying hot spent liquid bottoms from said reboiler to said bottoms heat exchanger, continuing through said bottom sheat exchanger in counterflow direction to said seventh liquid line, and continuing through a bottoms outlet pump; and

a ninth line connected to said float chamber for conducting distillate product from said float chamber to product storage;

whereby available heat from said bottoms liquid and said distillate vapor is withdrawn and reused by the distillation unti before said bottoms liquid and said distillate product exit the system to storage.

4,539,077

PROCESS FOR THE PREPARATION OF UREA

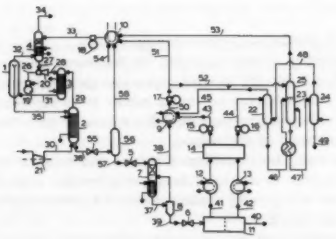
Kees Jonckers, Born; Petrus J. M. Van Nassau, Munstergeleen, and Andreas J. Biermans, Urmond, all of Netherlands, assignors to Unie van Kunstmestfabrieken B.V., Utrecht, Netherlands

Filed Apr. 21, 1983, Ser. No. 487,091

Claims priority, application Netherlands, Apr. 21, 1982, 8201652

Int. Cl.[3] **B01D** *3/00, 5/00*

U.S. Cl. 203—49 **10 Claims**



1. In a process for the preparation of urea from carbon dioxide and an excess of ammonia at an elevated temperature and pressure in a urea synthesis zone to form an aqueous urea synthesis solution containing urea, ammonium carbamate, and excess ammonia, and thereafter:

heating and stripping said urea synthesis solution in a stripping zone at an elevated pressure with a first stripping gas selected from the group consisting of carbon dioxide, ammonia, inert gas, and mixtures thereof, thereby decomposing ammonium carbamate and separately removing a stripping zone off-gas containing ammonia, carbon dioxide, and water vapor from a first urea solution still containing residual ammonium carbamate;

at least partially condensing said stripping zone off-gas in a first condensation zone to form a first ammonium carbamate solution;

introducing said first urea solution into a decomposition zone at reduced pressure relative to said stripping zone wherein a further portion of ammonium carbamate is decomposed and separately removing a decomposition zone off-gas containing ammonia, carbon dioxide, and water vapor, from a second urea solution;

further processing said second urea solution in a further processing zone to form a concentrated urea solution or solid urea product; and

condensing said decomposition zone off-gas in a second condensation zone to form a second ammonium carbamate solution;

the improvement comprising:

introducing a portion of said second ammonium carbamate solution into a desorption zone maintained at a pressure of between about 2 and 40 bar wherein a desorption zone off-gas more concentrated with respect to ammonia and carbon dioxide than said second ammonium carbamate solution is separately removed from a residual liquid phase;

condensing said desorption zone off-gas into a further portion of said second ammonium carbamate solution in a third condensation zone maintained at a pressure between about 2 and 40 bar to form a concentrated third aqueous ammonium carbamate solution; and

recycling said third ammonium carbamate solution to said urea synthesis zone.

4,539,078

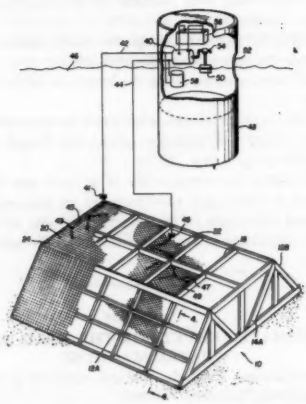
METHOD OF AND APPARATUS FOR MAKING A SYNTHETIC BREAKWATER

William R. Wingfield, Richmond, Va., assignor to Synthetic Breakwater, Richmond, Va.

Filed Oct. 22, 1984, Ser. No. 663,639

Int. Cl.[3] **C25B** *1/00;* **C25D** *9/08*

U.S. Cl. 204—1 R **15 Claims**



1. A method of making a synthetic breakwater in sea water comprising the steps of:

arranging a frame having the approximate shape of the breakwater to be made in sea water so that the frame is resting on a floor in the sea water and the frame is in said sea water, said frame comprising electrically insulative support members dfining two relatively flat, approximately parallel surfaces being separated by a gap of from 3 cm to 20 cm, said frame further comprising at least two flat electrically conductive electrodes approximately coextensive in lateral-dimension size and each being approximately of a lateral dimension size that a completed breakwater is to be, each flat electrode being mounted on one of

said frame surfaces opposite the other so that said flat electrodes are spaced a fixed distance of between 3 cm and 20 cm apart;

applying an electrical potential across said electrodes to cause a current density flowing between said electrodes of not greater than 0.1 ma/cm^2, with one of said electrodes becoming an anode and the other a cathode, said electrical potential being applied to each of said electrodes at numerous locations on said electrode, said locations being relatively uniformly positioned throughout the length and breadth of each of said electrodes, whereby said electrical potential is evenly distributed across said anode and cathode electrodes.

4,539,079

METHOD AND APPARATUS FOR ELECTROFORMING A STAMPER FOR PRODUCING A HIGH-DENSITY INFORMATION RECORDING CARRIER

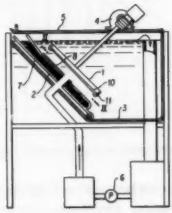
Norio Okabayashi, Himeji, Japan, assignor to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Jul. 6, 1984, Ser. No. 628,369

Claims priority, application Japan, Jul. 6, 1983, 58-121690

Int. Cl.^{3} C25D *1/10, 21/10, 21/12*

U.S. Cl. 204—5 **4 Claims**



1. A method for electroforming a stamper for producing a high-density information recording carrier by using a rotary electroforming apparatus having a fixed anode and a rotary cathode, the steps comprising removably mounting a shielding plate on the anode side of a clearance between said anode and said cathode, removably mounting a shielding plate on the cathode side of said clearance and, while electroforming a stamper in said apparatus is in progress, removing at least one of said removably mounted shielding plates thereby controlling the electroformed thickness distribution along a radial direction of the stamper to a desired value.

4,539,080

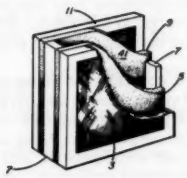
ELECTRO ORGANIC METHOD AND APPARATUS FOR CARRYING OUT SAME

Norman R. DeLue, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 478,940, Mar. 25, 1983, Pat. No. 4,472,252. This application Sep. 7, 1984, Ser. No. 648,425

Int. Cl.^{3} C25B *3/06*

U.S. Cl. 204—74 **8 Claims**



1. The method of electrolytically forming aniline comprising providing nitrobenzene at a cathode of an electrolytic cell having an anolyte compartment with an anode therein, a catholyte compartment with the cathode therein and an ion permeable separator defining an ionic aqueous material compartment between the catholyte and anolyte compartments, and passing an electrical current from the anode to the cathode.

4,539,081

PREPARATION OF BENZALDEHYDE DIALKYL ACETALS

Dieter Degner, Dannstadt-Schauernheim; Heinz Hannebaum, Ludwigshafen; Hardo Siegel, Speyer, and Walter Gramlich, Edingen-Neckarhausen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 623,210

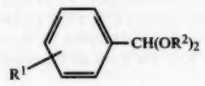
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 3322399

Int. Cl.^{3} C25B *3/02*

U.S. Cl. 204—78 **6 Claims**

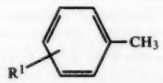
1. A process for the preparation of a benzaldehyde dialkyl acetal of the formula

I



where R^1 is alkyl of 1 to 8 carbon atoms and R^2 is methyl or ethyl, by electrochemical oxidation of an alkyltoluene of the formula

II



in an alkanol of the formula R^2OH and in the presence of an HO_3S-containing acid, wherein the electrochemical oxidation is carried out using an electrolyte which contains from 60 to 90% by weight of the alkanol, from 8.5 to 40% by weight of the alkyltoluene and from 0.01 to 1.5% by weight of the acid.

4,539,082

WOVEN DIAPHRAGM FOR AQUEOUS ELECTROLYTES

Helmut Klotz, Berg.-Gladbach, and Klaus Bloch, St.Augustin-Niederpleis, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 6, 1984, Ser. No. 617,691

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321159

Int. Cl.^{3} C25B *1/00*

U.S. Cl. 204—93 **29 Claims**

1. A woven diaphragm for an electrolytic cell comprising warp threads and weft threads, wherein said warp threads and said weft threads comprise multifil filaments and said weft threads contain less than about 200 turns per meter.

16. In a process for the electrolysis of water employing aqueous solutions containing alkali metal ions, chloride ions, sulphate ions or mixtures thereof in a diaphragm electrolysis cell, the improvement comprises electrolysizing said solution in said diaphragm electrolysis cell having a diaphragm as claimed in claim **1**.

4,539,083

METHOD FOR PREVENTING DEGRADATION IN ACTIVITY OF A LOW HYDROGEN OVERVOLTAGE CATHODE

Yasushi Samejima, Kakogawa; Minoru Shiga, Himeji; Toshiji Kano, and Takamichi Kishi, both of Kakogawa, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 26, 1984, Ser. No. 634,523
Claims priority, application Japan, Jul. 26, 1983, 58-136091
Int. Cl.³ C25B 1/16, 1/26
U.S. Cl. 204—98 5 Claims

1. A method of preventing degradation in activity of a low hydrogen overvoltage cathode in an electrolytic cell in the electrolysis of an aqueous alkali metal halide, said electrolytic cell being partitioned by an asbestos diaphragm or an ion exchange membrane into an anode compartment containing an anolyte and a cathode compartment containing a catholyte and being equipped with a low hydrogen overvoltage cathode, said method comprising adding a reducing agent to said catholyte during shutdown of the cell.

4,539,084

UNREINFORCED MEMBRANE, ELECTROCHEMICAL CELL AND ELECTROLYSIS PROCESS

Thomas C. Bissot, Newark, and Stephen Li, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 10, 1983, Ser. No. 473,963
Int. Cl.³ C25B 1/34, 13/02, 13/08
U.S. Cl. 204—98 51 Claims

1. In an unreinforced fluorinated cation-exchange polymer membrane which is an unreinforced film impermeable to hydraulic flow of liquid, said membrane comprising at least first and second layers of fluorinated polymer whose functional groups are —CFZ—COOM groups or —CFQ—SO_3M groups, where M is H, Na, K or NH_4, Z is F, CF_3 or CF_2Cl, and Q is F, Cl, C_1 to C_{10} perfluoroalkyl or CF_2Cl, adjacent said layers being in adherent contact with one another, said first layer being of polymer whose functional groups are -CFZ-COOM groups and said second layer being of polymer whose functional groups are —CFQ—SO_3M groups, the improvement wherein said membrane has a hydrogen bubble release layer at the outer surface of said first layer, has voids at the outer surface of said second layer characterized by a void content of 20 to 70%, and each said polymer with —CFZ—COOM groups has an equivalent weight of 670 to 1500 and each said polymer with —CFQ—SO_3M groups has an equivalent weight of 600 to 1500.

4,539,085

POROUS DIAPHRAGM FOR ELECTROLYTIC CELL

Jean Bachot, Fontenay aux Roses, and Jean Grosbois, L'Isle Adam, both of France, assignors to Chloe Chimie, Puteaux, France

Division of Ser. No. 378,222, May 14, 1982, Pat. No. 4,432,860. This application Dec. 6, 1983, Ser. No. 558,585
Claims priority, application France, May 15, 1981, 81 09688
Int. Cl.³ C25B 1/46, 1/34, 1/16, 13/08
U.S. Cl. 204—98 38 Claims

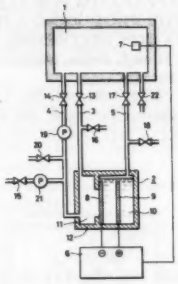
1. In an electrolyzing process carried out in an electrolytic cell comprising a porous diaphragm, the improvement which comprises utilizing as the diaphragm therefor, a porous diaphragm comprising an electrolytically acceptable porous sheet member having a total pore volume and average equivalent pore diameter adapted for electrolysis, and having an ion exchange resin fixedly deposited within the pores and occupying from 8 to 30% of the total pore volume thereof.

4,539,086

OXYGEN CONCENTRATION CONTROLLING METHOD AND SYSTEM

Yuko Fujita, and Hisashi Kudo, both of Kyoto, Japan, assignors to Japan Storage Battery Company Limited, Kyoto, Japan

Filed May 23, 1984, Ser. No. 612,945
Claims priority, application Japan, Aug. 31, 1983, 58-160075; Aug. 31, 1983, 58-160076; Sep. 17, 1983, 58-171920
Int. Cl.³ C25B 1/02, 9/00
U.S. Cl. 204—129 16 Claims



1. An oxygen concentration controlling method, comprising:

providing an electrochemical cell having a cathode comprising a gas diffusion electrode, an anode comprising an oxygen generating electrode, an electrolyte, a cathode gas chamber and an oxygen lead-out section, and having both a deoxygenating function and an oxygen generating function and coupling said cell to a chamber, the oxygen concentration in which is to be controlled, in such a manner that a deoxygenating path including said cathode gas chamber and an oxygen supplying path including said oxygen lead-out section are formed,

attaching a deoxygenated residual gas purge valve to said deoxygenating path, and disposing an oxygen purge valve in said oxygen supplying path,

detecting the oxygen concentration in one of said chamber and said deoxygenating path by means of an oxygen sensor, and

when the oxygen concentration is much higher than a predetermined value: opening a deoxygenating path valve in said deoxygenating path and said oxygen purge valve, closing an oxygen supplying path valve in said oxygen supplying path and said deoxygenated residual gas purge valve, applying a DC voltage between said cathode and said anode in said electrochemical cell to cause a deoxygenation reaction at said cathode, supplying a deoxygenated gas produced by said deoxygenation reaction through said deoxygenating path into said chamber, and purging oxygen generated from said anode through said oxygen purge valve, so that the oxygen concentration in said chamber is decreased to said predetermined valve, and

when the oxygen concentration is much lower than said predetermined value: opening said oxygen supplying path valve in said oxygen supplying path and said deoxygenated residual gas purge valve, closing said deoxygenating path valve in said deoxygenating path and said oxygen purge valve, supplying ambient air into said cathode gas chamber while applying a DC voltage between said cathode and said anode in said electrochemical cell to cause an oxygen generating reaction at said anode, supplying the

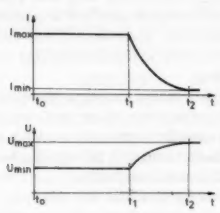
oxygen generated thereby through said oxygen supplying path into said chamber, and purging deoxygenated residual gas produced at said cathode through said deoxygenated residual gas purge valve, so that the oxygen concentration in said chamber is increased to said predetermined value.

4,539,087

METHOD FOR ELECTROLYTIC REMOVAL OF GALVANIC NICKEL, CHROMIUM OR GOLD LAYERS FROM THE SURFACE OF A COPPER OR COPPER ALLOY BASE AND APPARATUS FOR CARRYING OUT THE METHOD

Jenö Pojbics, and Ferenc Magyar, both of Esztergom, Hungary, assignors to Latszereszeti Eszkozok Gyara, Esztergom, Hungary

Continuation of Ser. No. 544,427, Oct. 21, 1983, abandoned. This application Nov. 5, 1984, Ser. No. 668,678
Claims priority, application Hungary, Oct. 29, 1982, 3483
Int. Cl.³ C25F *5/00, 7/00*
U.S. Cl. 204—146 **9 Claims**



1. A method for the electrolytic removal of a galvanic nickel, chromium or gold layer from the surface of a metal base of copper or copper alloy, comprising the steps of:

(a) carrying out the electrolysis in a bath comprising 20 to 50 percent by volume of sulphuric acid, 30 to 60 percent by volume of phosphoric acid, and 20 to 30 percent by volume of an organic acid, wherein the natural potential of the layer to be removed relative to the bath is negative and the natural potential of the metal base relative to the bath is positive,

(b) detecting the value of the current during the electrolysis, and

(c) finally breaking the path of the current when the value thereof drops below a predetermined threshold which is substantially lower than the current at the beginning of the electrolysis.

4,539,088

ELECTRODIALYSIS DESALINATION PROCESS SYSTEM FOR SEAWATER

Hiroshi Kaneda; Kenji Shibata, both of Kure; Mitugu Nomura, and Fumihiko Sano, both of Ohtemachi, all of Japan, assignors to Babcock-Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 355,358, Mar. 8, 1982, abandoned, which is a division of Ser. No. 133,962, Mar. 26, 1980, abandoned. This application Feb. 13, 1984, Ser. No. 578,324
Int. Cl.³ B01D *13/02*
U.S. Cl. 204—182.5 **11 Claims**

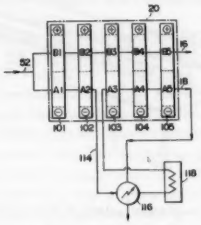
1. An electrodialysis desalination method for seawater comprising:

providing an electrodialyzer having a plurality of serially connected electrodialysis cells each comprising a plurality of alternating arranged cation exchange membranes and anion exchange membranes connected to one another between two electrodes to form a plurality of dilution compartments and concentration compartments therebetween;

supplying seawater to the first electrodialysis cell for separating the seawater into two portions including a diluted solution from said dilution compartments and a concentrated brine solution from said concentration compartments, respectively, by electrodialyzing;

extracting dilute solution from the dilution compartments of at least one of said electrodialysis cells;

heating only the extracted dilute solution to within the temperature range of 30°–90° C. to maintain the dilute solution at a temperature higher than that of the concentrated brine solution in succeeding electrodialysis cells;



returning all the heated extracted dilute solution to the corresponding dilution compartments of the next cell in said plurality of electrodialysis cells; and

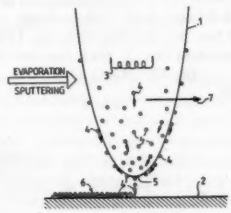
thereafter passing the heated dilute solution and concentrated brine serially through the remaining ones of said cells, said concentrated brine being supplied only to said concentration compartments and said dilute solution being supplied only to said dilution compartments in the remaining ones of said serially connected electrodialysis cells.

4,539,089

METHOD FOR DEPOSITING MATERIAL WITH NANOMETER DIMENSIONS

Gerd K. Binnig, Richterswil; Christoph E. Gerber, Adliswil; Heinrich Rohrer, Richterswil, and Edmund Weibel, Adliswil, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,177
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R **11 Claims**



1. Method for depositing material from a conductive tip onto the surface of a substrate, said tip being supported at a controlled distance shorter than 10^{-8} m from said substrate, characterized in that said tip (1) is provided with free metal atoms (4) at its surface, the atoms (4) at the operating temperature of the tip (1) having a sufficiently large mobility to permit their movement versus the apex (5) of said tip (1), and that between said tip (1) and said substrate (2) a potential difference is maintained the level of which is sufficient to lead to field-desorption of said free metal atoms (4) across said distance between said

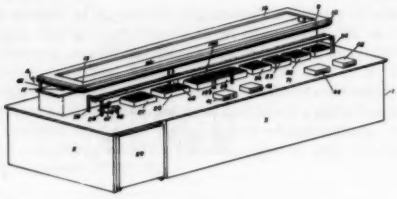
tip (1) and said substrate (2) and to the deposition of said atoms (4) on said substrate (2).

4,539,090

CONTINUOUS ELECTROPLATING DEVICE

William L. Francis, 18 Chimney Wood, Floyd Knobs, Ind. 47119

Filed Apr. 27, 1984, Ser. No. 604,970
Int. Cl.³ C25D *17/00, 17/06, 17/28*
U.S. Cl. 204—198 **14 Claims**



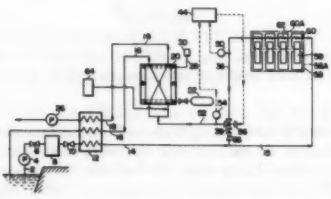
1. A device for plating selected first portions of a selected item including an electroplating bath means, a conveyor disposed for movement above the electroplating bath, retainer devices provided to be carried by the conveyor in spaced relation above the electroplating bath, where the retainer devices include a base having a connector to connect the base to the conveyor so that the retainer is disposed between the conveyor and the electroplating bath; cover means provided to be positioned in facing relation to and hingedly connected to said base at the upper edge thereof to receive said item therebetween, and cover second portions of the item which are not to be electroplated; bias means carried by said cover means to urge said item against said base means so a portion of the item to be electroplated extends downwardly from the bottom of the base to be received in the electroplating bath and so said item is releasably retained between said cover means and said base means; and elastomeric base mask means covering a portion of the face of said base facing said cover and elastomeric cover mask means covering a portion of said cover facing said base means so said item to be electroplated is engaged by said base mask and said cover mask when said cover is in said normal position.

4,539,091

ELECTRODIALYSIS DESALINATION PROCESS AND SYSTEM FOR SEAWATER

Hiroshi Kaneda; Kenji Shibata, both of Kure; Mitugu Nomura, and Fumihiko Sano, both of Ohtemachi, all of Japan, assignors to Babcock-Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 133,962, Mar. 26, 1980, abandoned. This application Oct. 3, 1983, Ser. No. 537,550
Int. Cl.³ B01D *13/02*
U.S. Cl. 204—301 **20 Claims**



1. An electrodialysis desalination system for seawater comprising:

preheater means utilizing solar heat for preheating seawater comprising:

a heat accumulator containing heat transfer medium and provided therethrough with at least one pipeline for supplying seawater in heat transfer relation to said accumulator heat transfer medium;

a heat collector utilizing solar heat;

gravity actuated heat pipe means interconnecting said heat collector and said heat accumulator for transferring heat from said heat collector to said heat accumulator, said heat pipe means enclosing a heat transfer medium for repeating evaporation and condensation by heating and cooling, respectively, and having an evaporating portion and a condensing portion separate from and in heat transfer relation respectively with each of said heat collector and said heat accumulator so that heat from said heat collector evaporates the heat transfer medium in said heat pipe means to produce vapor that condenses while transferring heat to said heat accumulator, wherein said heat transfer medium is provided in an amount equal to the amount required to form only a film on the entire inner surface of said heat pipe means, said amount of medium being contained in the evaporation portion only when the medium is in the condensed state so that said heat pipe means transfers vapor only towards said heat accumulator and transfers condensate only towards said heat collector and heat is transferred only to the accumulator by evaporating and condensing;

electrodialyser means having a plurality of ion exchange membranes forming dilute and concentrate chambers therebetween for separating seawater thus preheated by said preheater into two portions including diluted solution and concentrated brine;

means including pipelines for supplying seawater to said preheater and then from said preheater to the electrodialyser;

a bypass line provided between the pipeline leading from the preheater to the electrodialyser and the pipeline for supplying seawater;

control means for detecting temperatures and flow rates of seawater flowing out of the preheater and passing through the bypass line and for controlling the flow rates of seawater in said lines, so that the temperature of seawater flowing into the electrodialyser can be set at a given value of temperature; and

gas bubble producing means for cleaning said ion exchange membranes by passing bubbles through said chambers, cleaning the gas after it has passed through said chambers and recirculating the cleaned gas to the electrodialyser.

4,539,092

PLASMA OXYGEN PERMEABILITY METER

Louis W. Morgan, P.O. Box 5129, San Francisco, Calif. 94101

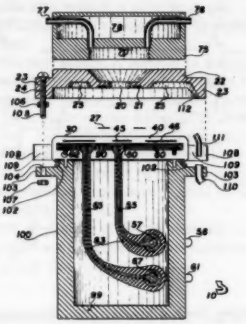
Filed Nov. 7, 1983, Ser. No. 549,021
Int. Cl.³ G01N *27/48*
U.S. Cl. 204—415 **14 Claims**

1. A polarographic cell having substantially uniform electrochemical reactivity on a relatively large planar area, comprising:

a. an electrical conductor with a planar surface, and

b. means to compensate for the effect on an electrolyte of unequal distribution of electrostatic charge on said surface by preventing electron transfer across the boundary between said surface and said electrolyte wherever said electrostatic charge on said surface has high enough density to substantially alter the ion concentrations at said boundary, such as to ensure that electrons move across said boundary only where said electrostatic charge has

low enough density to permit said ion concentrations at said boundary to be substantially uniform,



whereby electrochemical reactions take place in said cell with substantial uniformity as described by the Nernst equation for said substantially uniform ion concentrations.

4,539,093

EXTRACTION PROCESS AND APPARATUS FOR HYDROCARBON CONTAINING ORES

Robert H. Friedman, and Bertram E. Eakin, both of Houston, Tex., assignors to Getty Oil Company, Houston, Tex.

Filed Dec. 16, 1982, Ser. No. 450,265
Int. Cl.³ C10G *1/04*
U.S. Cl. 208—8 LE **16 Claims**

1. A hydrocarbon extraction process for removing hydrocarbons from a hydrocarbon containing ore, comprising:

processing the ore to the extent required to form an extractable ore, said processing step comprising drying the ore to remove water in the ore and reducing the size of the ore;

mixing the extractable ore and a carrier to form a flowable ore stream, the carrier comprising a granular material having a low affinity for hydrocarbons and being of sufficient size to increase the permeability of the flowable ore stream to a nonaqueous extracting solvent when in the presence of any fines, while reducing the ability of the flowable ore stream to be fluidized;

thereafter passing the nonaqueous extracting solvent in substantially vertical countercurrent flow and at a sufficient velocity relative to the ore stream to contact the nonaqueous solvent with the ore stream without substantially fluidizing the ore stream and form a product-solvent stream comprising hydrocarbons and solvent and a spent ore stream comprising spent ore and solvent; and

separating solvent from the product-solvent stream to produce a hydrocarbon stream.

4,539,094

EXTRACTION OF DEPOLYMERIZED CARBONACEOUS MATERIAL USING SUPERCRITICAL AMMONIA

Swaminathan Sunder, and Robert N. Miller, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 19, 1984, Ser. No. 601,890
Int. Cl.³ C10G *1/00, 1/06*
U.S. Cl. 208—8 LE **7 Claims**

1. An extraction process for separating solid depolymerized carbonaceous product from carbonaceous materials selected from the group of wood, peat and low rank coals which are subjected to a depolymerization pretreatment in an aqueous alkali medium at elevated temperature and pressure, wherein the extraction is performed with ammonia under supercritical conditions on said pretreated solid materials which are retained in an aqueous presence subsequent to pretreatment such that the materials have an incipient moisture content of at least 30% during extraction.

4,539,095

AQUEOUS ALKALI DEPOLYMERIZATION OF COAL WITH A QUINONE

Swaminathan Sunder, and Robert N. Miller, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 19, 1984, Ser. No. 602,024
Int. Cl.³ C10G *1/00, 1/06*
U.S. Cl. 208—8 LE **12 Claims**

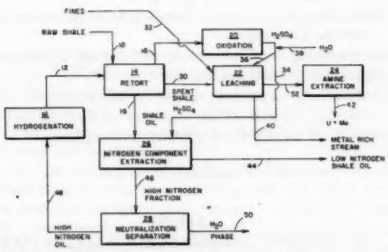
1. A process depolymerizing solid raw coal selected from the group of bituminous, sub-bituminous and lignite coal, by the treatment of the coal in an aqueous alkaline medium in the presence of a quinone selected from the group comprising alkali stable quinones at a temperature of 110°-350° C. and in a hydrogen atmosphere at a partial pressure in the range of 500 to 3000 psi to product a depolymerized solid coal product.

4,539,096

PROCESS FOR RECOVERING OIL AND METALS FROM OIL SHALE

Leslie R. Rudnick, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 16, 1984, Ser. No. 631,685
Int. Cl.³ C10G *1/00, 17/06*
U.S. Cl. 208—11 R **28 Claims**



1. A method for recovering hydrocarbonaceous materials from minerals containing same, particularly oil shale, under oil shale retorting conditions where a nitrogen containing product shale oil has nitrogen components extracted therefrom by an internally produced mineral acid which is also used to leach spent shale to recover minerals comprising the steps of:

(a) retorting under oil shale retorting conditions;

(b) obtaining from the retorting step a product shale oil which contains nitrogen components therein;

(c) producing sulfuric acid from a hydrogen sulfide containing off gas generated from the retorting step;

(d) contacting a portion of said sulfuric acid with product shale oil and extracting therefrom a substantially high nitrogen-containing fraction and a substantially low nitrogen-containing shale oil; and

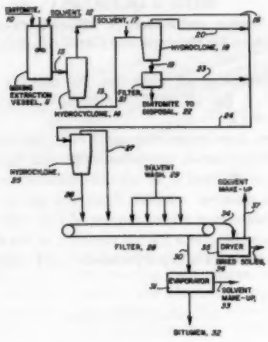
(e) hydrogenating and recycling said substantially high nitrogen-containing fraction into the oil shale retort under oil shale retorting conditions to obtain increased amounts of hydrocarbonaceous materials.

4,539,097

METHOD FOR FILTERING SOLVENT AND TAR SAND MIXTURES

Jeffrey C. Kelterborn, Hinsdale, and Richard A. Stone, Yorkville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 29, 1984, Ser. No. 584,718
Int. Cl.³ C10G 1/04
U.S. Cl. 208—11 LE **20 Claims**



13. A method for the extraction of bitumen from bitumen containing diatomite comprising:

(a) contacting bitumen containing diatomite with an organic solvent;

(b) separating a solution of bitumen, spent diatomite and solvent into a first stream comprising coarser spent diatomite, bitumen and solvent, and a second stream comprising finer spent diatomite bitumen and solvent;

(c) filtering the coarser spent diatomite from the first stream to produce a filter cake;

(d) filtering the finer spent diatomite from the second stream with the filter cake;

(e) combining the filtered first and second streams to produce a combined stream; and

(f) separating bitumen from the combined stream, wherein steps (a), (b) and (c) are repeated so that the filter cake produced in step (b) is continuously replaced.

4,539,098

UPGRADING CARBONACEOUS MATERIALS

Amos Yudovich, Tulsa, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 22, 1984, Ser. No. 623,595
Int. Cl.³ C10G 1/04
U.S. Cl. 208—11 LE **6 Claims**

1. A process comprising

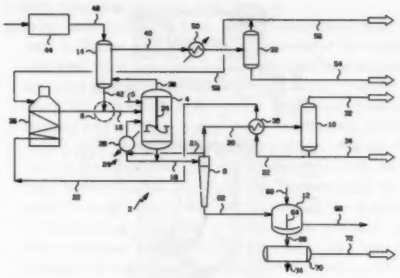
(a) mixing a hot liquid oil with oil shale particles to form a slurry; wherein the slurry is formed by mixing each 1 part by weight of oil shale which has been preheated by contact with hot gases to a temperature in the range of 200°–1000° F. within the range of from about 0.2 to about 20 parts by weight of the hot oil;

(b) maintaining the slurry at a temperature in the range of 650°–1250° F. in an extraction zone for a period of time sufficient to decompose a portion of the oil shale into lighter products;

(c) withdrawing a stream of hot gases from the extraction zone;

(d) passing said stream of hot gases into contact with the oil shale particles to be used in forming the slurry;

(e) separating the at least a portion of the oil shale from the at least a portion of the hot liquid oil;



(f) fractionating the hot liquid oil in a fractionation zone; and

(g) cooling the oil shale in a cooling zone.

4,539,099

PROCESS FOR THE REMOVAL OF SOLIDS FROM AN OIL

Philip Merchant, and R. Roger Wunderlich, both of Houston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 567,257, Dec. 30, 1983, abandoned, which is a continuation of Ser. No. 500,638, Jun. 3, 1983, abandoned. This application Sep. 20, 1984, Ser. No. 652,792
Int. Cl.³ C10G 29/00
U.S. Cl. 208—177 **9 Claims**

1. A process for reducing the particulate solids content of a hydrocarbon oil fraction comprising:

providing a hydrocarbon oil fraction boiling in the range of from about 200° C. to about 550° C.;

treating said hydrocarbon oil fraction with an agglomeration aid wherein the resulting mixture contains from 10 to 1000 weight parts per million of said aid based on the total weight of said mixture, said agglomeration aid comprising oxyalkylated phenol formaldehyde resin glycol ester of $\overline{M}w$ ranging from 500 to 50,000; and,

recovering a hydrocarbon oil bottoms portion having a reduced content of filterable solids.

4,539,100

METHODS FOR REMOVING PARTICULATE SOLIDS AND WATER FROM PETROLEUM CRUDES

Clifford P. Ronden, Edmonton, Canada, assignor to Husky Oil Operations Ltd., Alberta, Canada

Continuation of Ser. No. 397,696, Jul. 13, 1982, abandoned. This application Nov. 17, 1983, Ser. No. 552,865
Int. Cl.³ C10G 33/00, 33/04
U.S. Cl. 208—188 **6 Claims**

1. The method for removing inorganic particulate solids and water from a heavy crude oil obtained by an enhanced recovery procedure and which has a BS&W content in excess of pipeline specifications including a significant proportion of water present as the disperse phase of a water-in-oil emulsion, the heavy crude oil having been blended with a compatible hydrocarbon diluent to provide an API gravity of at least 17, comprising treating the blended crude to destabilize the water-in-oil emulsion wherein said treating step is accomplished by adjusting the pH of the crude to at least 8, and

uniformly distributing throughout the crude a small proportion of at least one additive selected from the group consisting of alkali metal, alkaline earth metal and ammonium hydrosulfites, hydrosulfides and monosulfides,

the amount of the at least one additive being in the range of

from a few hundreths of a percent to several percent of the weight of the blended crude;
providing in uniform distribution throughout the crude so treated with a demulsifier composition comprising
an anionic surfactant which is soluble in oil,
a nonionic surfactant which is insoluble in water and dispersible in oil, and
a cationic surfactant which is soluble in water,
the anionic surfactant constituting 5–20 parts by weight and the nonionic and cationic surfactants each constituting 2–10 parts by weight of the demulsifier composition,
the amount of the demulsifier composition distributed throughout the crude being such that the total surfactant weight equals 50–300 grams per barrel of blended crude;
separating the resulting crude into at least an oil phase and a water phase; and
recovering the oil phase as clean blended crude having a BS&W content within pipeline specifications.

4,539,101

METHOD AND CATALYST FOR REMOVING CONTAMINANTS FROM HYDROCARBONACEOUS FLUIDS USING A COPPER-GROUP VIA METAL-ALUMINA CATALYST

Stephen M. Oleck, Moorestown; Quang N. Le, Westville, and Daniel J. Neuman, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 17, 1983, Ser. No. 524,064
Int. Cl.³ C01G *45/04*
U.S. Cl. 208—251 H **16 Claims**

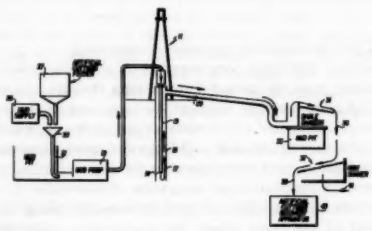
1. A method for reducing the arsenic, nickel and iron content of a hydrocarbonaceous fluid, said method comprising:
contacting said fluid with a particulate catalyst consisting essentially of an oxide or sulfide of copper and an oxide or sulfide of a Group VIA metal on a porous alumina support in the presence of hydrogen under sufficient metal reducing conditions.

4,539,102

METHOD AND APPARATUS FOR SEPARATING ARTIFICIAL DRILL CUTTINGS FROM NATURAL DRILL CUTTINGS

William G. Boston, Dallas, and Robert T. Strong, Plano, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 9, 1983, Ser. No. 549,848
Int. Cl.³ B03C *1/16, 1/30*
U.S. Cl. 209—38 **20 Claims**



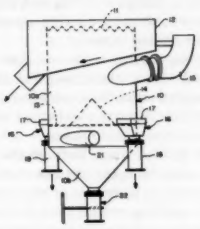
1. An apparatus for separating artificial drill cuttings from a mixture containing artificial drill cuttings having predetermined magnetic properties and other drill cuttings not having said predetermined properties, comprising:
conveyor means including a first endless belt positioned for carrying magnetic artificial cuttings and non magnetic cutting on its upper surface and feeding said mixture to one end of the first belt;
a rotating drum at said one end of said first belt about which said first belt passes, said rotating drum being magnetized over at least a portion of its circumferential peripheral surface, said drum attracting and holding said artificial drill cuttings to said first belt by means of its magnetization and not holding said other drill cuttings to said first endless belt so that said other drill cuttings fall off the end of the first belt as it passes over the drum;
means for collecting said other drill cuttings which are not held to said first belt;
a second endless belt positioned so as to carry the artificial drill cuttings and extending generally parallel to said first belt over at least part of its length and forming a nip with said first endless belt at a position adjacent said drum for carrying the artificial drill cuttings between it and said first endless belt, and
means spaced from said drum for collecting artificial drill cuttings carried from said first endless belt.

4,539,103

HYDRAULIC SEPARATING METHOD AND APPARATUS

Clinton A. Hollingsworth, Lakeland, Fla., assignor to C-H Development and Sales, Inc., Lakeland, Fla.

Continuation-in-part of Ser. No. 368,625, Apr. 15, 1982, abandoned, and Ser. No. 338,341, Jan. 11, 1982, abandoned, said Ser. No. 368,625, is a continuation-in-part of Ser. No. 338,341,. This application Sep. 22, 1983, Ser. No. 534,975
Int. Cl.³ B03B *5/66*
U.S. Cl. 209—158 **7 Claims**



1. Apparatus for separating the solid particles of a hydrous slurry into fractions containing solid particles differing in settling velocity, comprising:
(a) an upright tank having a central axis;
(b) means at the top of the tank for effecting the discharge of an overflow fraction;
(c) perforate barrier means located between the upper and lower ends of the tank and serving to divide the interior of the tank into an upper chamber and a lower space within the lower portion of the tank, an imperforate inverted cone is disposed on a central portion of the barrier means and is surrounded by an outer annular perforate portion of the barrier means;
(d) conduit means for introducing a feed slurry tangentially into the upper chamber intermediate the barrier means and the top of the tank and at a substantially constant hydrostatic head, whereby the slurry in the upper chamber is caused to have swirling movement about the central axis of the tank, the swirling movement extending to a region immediately above the upper side of the annular perforate portion of the barrier means;
(e) piping means for introducing water into the space below the barrier means whereby water is caused to flow upwardly through the barrier means and through the slurry in the chamber, whereby hydraulic separation takes place within the upper chamber of the tank, with particles of lower settling velocity progressing upwardly and into the means for effecting discharge of the overflow fraction, and particles of greater settling velocity progressing downwardly to said region adjacent the upper side of the annular perforate portion of the barrier means; and

(f) means communicating with the region of the tank immediately above the barrier means for withdrawing an underflow fraction from the region, the underflow fraction containing the solid particles of greater settling velocity which are separated from the particles of lower settling velocity.

5. A hydraulic method for separating the solid particles of a hydrous feed slurry into separate overflow and underflow fractions, where the slurry solid particles have different settling velocities, the method making use of apparatus comprising an upright tank having a central axis, and also having overflow discharge means at its upper end, perforate barrier means located between an upper chamber of the tank and a space in the lower portion of the tank below the barrier means, the tank also having conduit means for introducing the feed slurry into the upper chamber, together with pipe means for introducing water into the space below the barrier means, and means for withdrawing an underflow fraction containing the solid particles of greater settling velocity, the method comprising:

(a) introducing the feed slurry tangentially into the chamber above the barrier means by way of the conduit means and intermediate the barrier means and the overflow discharge means to form a swirling body of material, the swirling movement extending from a region adjacent the upper side of the barrier means to the overflow means;

(b) continuously introducing water under pressure into the space below the barrier means by way of the pipe means whereby water flows upwardly through the perforate barrier means to merge with the swirling body of material in said chamber, thereby causing upward progression of water in the swirling material;

(c) the swirling movement of the material in the upper chamber being such that it causes swirling movement of material in the region immediately above and adjacent to the upper side of the barrier means and whereby there is a substantial absence of turbulence;

(d) the upward flow of water through the barrier means and the swirling material in the chamber being so controlled as to have an upward flow rate in the swirling body that is less than the settling velocity of the particles of greater settling velocity and greater than the settling velocity of the particles of lower settling velocity, whereby the particles of greater settling velocity progress downwardly;

(e) causing the downwardly progressing particles of greater settling velocity to be directed toward an outer annular perforate portion of the barrier means and into said region immediately above said perforate barrier means; and

(f) removing the particles of greater settling velocities from said region immediately above said annular perforate portion, by way of the underflow fraction withdrawal means.

4,539,104

BUCKET ELEVATOR LINKAGE FOR COARSE COAL WASHER

Royce Jackson, P.O. Box 127, Dubois, Ill. 62831

Filed Aug. 7, 1984, Ser. No. 638,410
Int. Cl.³ B03B *5/30*
U.S. Cl. 209—172.5 **19 Claims**

1. An elevator mechanism for removing refuse material having abrasive characteristics, the mechanism comprising:

a plurality of buckets having parallel vertical sides;

roll pins and bushings for receiving said roll pins extending normally from near the top and bottom of each bucket side;

links having openings receiving said roll pins connecting said buckets so that each link connects the top roll pin of one bucket to the lower roll pin of the adjacent bucket to form an endless bucket elevator, each roll pin including a retaining head which is disposed outwardly and spaced from its corresponding links;

a plate rigidly affixed adjacent each said roll pin to the outside of each said bucket side, said plate having a first part extending outwardly of said bucket side to which it is affixed and a second part spaced outwardly of said bucket side to form a fork arrangement which defines a space between said second part and said bucket side which includes a said bushing as opposing sides of the fork, said

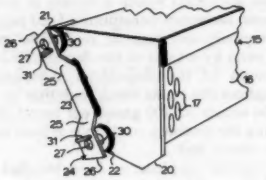


plate further having an opening aligned with the bore of said bushing in said fork arrangement receiving said roll pin, said link receiving said roll pin in said fork arrangement between said second part and the corresponding said bushing.

4,539,105

CYCLONE SEPARATOR HAVING ABRASION RESISTANT CONE COVERED BY A PLASTIC SLEEVE WITH FLEXIBLE SEAL REGIONS

Robert L. Metcalf, Beaverton, Oreg., assignor to Wilbanks International, Inc., Hillsboro, Oreg.

Filed Nov. 17, 1983, Ser. No. 553,320
Int. Cl.³ B04C *5/28*
U.S. Cl. 209—211 **10 Claims**

1. Cyclone separator apparatus, comprising:

a hollow separator cone member of abrasion resistant ceramic material having a stock inlet through the wall of said cone member adjacent the large end of the cone of largest diameter, a first outlet at the small end of said cone and a second outlet at said large end spaced inward from said input, said cone member having a conical shaped portion for centrifugal separation of materials;

a vortex finder member of ceramic material closing the large end of the cone except for a restricted outlet passage which is of smaller diameter than the larger end of said cone to provide said second outlet;

a cover sleeve of plastic material covering the outer surface of said cone, said abrasiion resistant material being of greater hardness than said plastic material of said sleeve; and

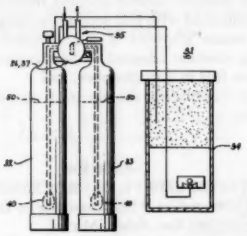
a plurality of flexible seal regions of plastic formed at longitudinally spaced positions in said cover sleeve including sealing projections provided on the outer surface of said seal regions, at least one of said seal regions being positioned radially outward and aligned with the outer surface of the cone.

4,539,106

SYSTEM AND APPARATUS FOR WATER CONDITIONING

Arthur G. Schwartz, Phoenix, Ariz., assignor to Charles E. Cates, Phoenix, Ariz.

Filed Dec. 2, 1983, Ser. No. 557,645
Int. Cl.³ B01J *49/00*; C02F *1/42*
U.S. Cl. 210—88 **22 Claims**



8. In a water softening system adapted to be connected between a hard water supply line and a user service line including a pair of tanks one of which is adapted for regeneration while the other is adapted for service, and vice-versa, and a salt storage and brine formation tank, water operated automatic control apparatus comprising:

a first parallel plate valve means rotatably having a first position and a second position, respectively, for connecting the first of said tanks from the hard water supply line to the user service line, connecting the second of said tanks for regeneration, and vice-versa,

a soft water use metering device connected in said user service line,

a first cylinder and two-way operating piston therein for shifting said first parallel plate valve means from said first to said second position and vice-versa,

a first mechanical link from said operating piston to said first parallel plate valve means,

a second parallel plate valve means which is rotatable for supplying operating pressure in succession for each way of said operating piston,

a driving connection from said metering device to said second parallel plate disk valve means for rotation thereof in response to soft water use,

a third parallel plate valve means for controlling the sequence of regeneration steps in the tank being regenerated following each shift of said first parallel plate valve means, one of the plates of said third parallel plate valve means being rotatable under the influence of soft water pressure from said user service line for causing soft water flow including in succession initiation, rapid backwash, brine injection and backwash, further rapid backwash, brine forming, and purging,

control valve means including a second cylinder, first, second, third, and fourth pistons therein, and means for actuating said pistons,

a first line forming a drain from said third parallel plate valve means,

said first piston being in said first line for controlling said drain, said first piston having an initial position closing said first line and a second position opening said first line,

a second line for supplying soft water pressure from said user service line to said third parallel plate valve means,

said second piston being in said second line for controlling flow of soft water therein, said second piston having an initial position closing said

second line and a second position opening said second line,

a second mechanical link from said operating piston to said first piston and said second piston to actuate same, respectively, in one direction to their said second positions after each operation of said operating piston, thereby initiating rotation of said one plate of said third parallel plate valve means, said rotation continuing as soft water flow continues through said third parallel plate valve means producing said sequence of regeneration steps,

a third line for supplying soft water pressure from said user service line to said second parallel plate valve means,

said third piston being in said third line for controlling the flow of soft water therein, said third piston having an initial position opening said third line and a second position closing said third line,

means including a fourth line from said third parallel plate valve means to said second cylinder for actuating said third piston to its said second position after said initiation, thereby blocking said third line and preventing further rotation of said second parallel plate valve means and consequent further action of said operating piston during a particular regeneration cycle,

brine line means running from said third parallel plate valve means to said first parallel plate valve means,

a connection from said brine line means to said brine forming tank for supplying brine and backwash water to the one of said first and second tanks under regeneration,

means in said second cylinder including said third piston in its said second position for opening said connection to said brine forming tank at the time of actuating thereof to its said second position,

a brine water refill line running from said third parallel plate valve means to said salt storage and brine forming tank,

said fourth piston being in said brine water refill line for controlling the supply of soft water therein,

said fourth piston having an initial position closing said refill line and a second position opening said refill line,

said fourth piston being actuated to its said second position by the actuating means of said third piston at the time of actuating of said third piston to its said second position,

purge lines means running from said third parallel plate valve means to said first parallel plate valve means and therefrom back to said third parallel plate valve means and to a drain therein for conducting purge water flow to and from the tank being regenerated,

a reset line comprising said first line running from said third parallel plate valve means to said first piston,

said first piston in its said initial position closing said reset line and in its said second position opening said reset line,

said first piston being further actuated to its said first position in response to movement of said third piston to its second position whereby continuation of pressure from said third parallel plate valve means through said reset line actuates said third and fourth pistons and said second piston to respective initial positions, and

rotation of said one of said plates of said third parallel plate valve means determining the respective times of backwashing, brine injecting and backwashing, brine forming and purging.

4,539,107

PHASE SEPARATION DETECTING FILTER

William R. Ayers, P.O. Box 127, Bement, Ill. 61813

Filed Jul. 13, 1984, Ser. No. 631,891
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—96.1 **17 Claims**

1. A filter for sensing phase separation in an alcohol bearing gasoline product comprising:

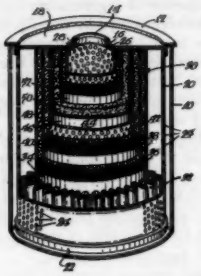
a composite filter media including:

(a) a mechanical filtering layer;

(b) a first swelling layer including a first material capable of absorbing a water containing liquid and swelling to substantially increase its volume in response thereto; and

(c) a second swelling layer including a second material capable of absorbing an alcohol rich liquid and swelling to substantially increase its volume in response thereto; and

means, including an inlet and an outlet, housing said media and defining a flow path through said media between said



inlet and said outlet which is at least partially blocked by swelling of either of said first and second layers.

4,539,108

FUEL HEATING TYPE FUEL FILTER DEVICE

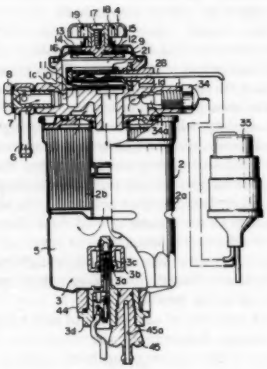
Kouji Izutani, Anjo; Isamu Shigeta, Toyota; Akio Nara, Okazaki, and Hidetaka Hayashi, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 11, 1984, Ser. No. 599,275

Claims priority, application Japan, Apr. 12, 1983, 58-64950

Int. Cl.³ F02M *31/00*; B01D *23/00*

U.S. Cl. 210—104 **10 Claims**



1. A fuel filter device for use with diesel engines, comprising:

a body member defining therein an inlet for fuel from a fuel tank and a fuel outlet;

a filter assembly including a container and a filter element housed therein, said container being formed therein with a first opening and detachably and sealingly attached to said body member such that said fuel outlet is in fluid-flow communication with said first opening;

manually operable pump means mounted on said body member to cooperate therewith to define a chamber adapted to be communicated with said inlet and outlet, said pump means including a diaphragm facing said chamber and an actuating member manually operable to resiliently deform said diaphragm so that a pressure variation is caused in said chamber;

valve means operatively associated with said inlet and outlet and responsive to a fuel pressure at said inlet and to the pressure variation in said chamber to control the communication between said inlet and said chamber and the communication between said chamber and said outlet;

said container being formed therein with a second opening adjacent to said filter element;

said filter assembly being constructed such that the fuel from said outlet enters said container through said first opening and flows through said container to said second opening along a path of flow, said filter element forming a part of said path of flow;

said body member further defining therein a discharge port communicated with said second opening in said container;

heating means disposed in said chamber and including a heating element adapted to be electrically energized to heat the fuel in said chamber; and

means for controlling the electrical supply to said heating element.

4,539,109

DRAIN SYSTEM FOR FUEL PROCESSOR APPARATUS

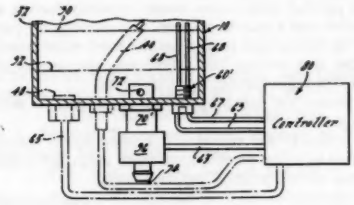
Leland L. Davis, Saline, Mich., assignor to Davco Manufacturing Corporation, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 463,041, Feb. 1, 1983,. This application Jan. 23, 1984, Ser. No. 573,292

The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.³ B01D *27/10*

U.S. Cl. 210—104 **48 Claims**



1. In a fuel processor operative to separate out water or other impurities from fuel, the fuel processor including a chamber adapted to receive the fuel flowing therethrough, the water in the fuel or other impurities being separated into a lower portion of the chamber, the improvement comprising:

chamber quantity sensing means located in the chamber for detecting the presence of at least one predetermined quantity of water or other impurities therein said chamber quantity sensing means includes first and second electrical contacts disposed at opposing sides of said chamber;

drain means actuatable to discharge at least a portion of the water or other impurities from the chamber in response to the detection of said predetermined quantity of water or impurities by both said first and second electrical contacts of said chamber quantity sensing means; and

control means for causing actuation of said drain means in response to the detection of said predetermined quantity or other impurity in the chamber,

whereby the quantity of said water or other impurities in the chamber is maintained at or below said predetermined quantity.

4,539,110

LIQUID AERATOR

John C. Hardison, 2500 W. Skelley, Tulsa, Okla. 74107

Filed Aug. 3, 1983, Ser. No. 519,983

Int. Cl.³ B01F *3/04*

U.S. Cl. 210—150 **11 Claims**

1. A liquid contacting device, comprising:

a rotatable plate presenting a generally planar face; and

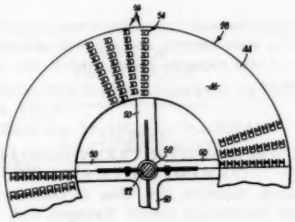
a plurality of liquid-contacting elements affixed to and pro-

jecting from said plate face, each of said elements including structure defining an inboard first margin adjacent said plate face;

an outboard, second margin spaced outwardly from said plate face and offset in a trailing direction from said first margin with respect to the normal direction of rotation of the plate;

an elongated first surface extending between said first and second margins and lying at an acute angle relative to the plane of said plate face,

said first surface normally leading with respect to the direction of rotation of the plate; and



a second, normally trailing surface extending between said second margin and said plate face and lying at an acute angle relative to the plane of said plate face,

said first and second surfaces diverging with respect to each other as they extend toward said plate face,

said second surface being configured to present a concave air entrapment region therein,

said concave region being elongated and extending along the length of said second surface,

said concave region being arcuate in cross section and having the longitudinal axis thereof intersecting said plate face.

4,539,111

EXTRACTION APPARATUS

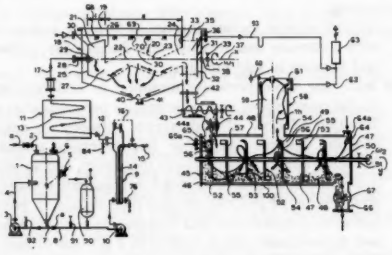
István Takács; György Kerey; Péter Rudolf; János Illés; Béla Szabó; Endre Vereczkey; Zoltán Bános; Gyula Bosits, and László Czebe, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Mar. 19, 1980, Ser. No. 131,887

Claims priority, application Hungary, Mar. 21, 1979, RI 703

Int. Cl.³ B01D *35/18*

U.S. Cl. 210—179 **8 Claims**



1. An apparatus for heat treating a biologically contaminatable material to obtain solids in granular form and to remove fats therefrom, said apparatus comprising:

(a) an instant heater in the form of a heat exchanger for treating said material in a liquid state with a heating fluid for a residence time of a maximum of two minutes and sufficient to raise the temperature of said material to 50° to 125° C.;

(b) hot-storage means connected to said instant heater for the continuous displacement of said material along a storage path while maintaining said material at a temperature of 50° to 125° C. for a minimum of two minutes thereby melting any fats contained is said material;

(c) a filter connected to said hot storage means for filtering said material and including a closed housing, a rotating elongate filter body in said housing and means for introducing vapor into said housing at a temperature of substantially 50° to 125° C., thereby separating solids of said material and advancing said solids from one end of said body to the opposite end thereof, and extracting a liquid phase from said material through a wall of said body, said filter being constructed and arranged to advance said solids through said body for a minimum of 4 minutes; and

(d) a dryer connected to said filter and receiving said solids from said body.

4,539,112

HORIZONTAL-AXIS AERATOR FOR PURIFICATION OF WASTE WATER

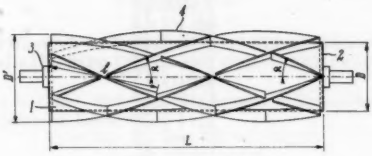
Jean Durot, Villepreux, and Jacques Bernard, St. Germain en Laye, both of France, assignors to Société Degremont, Rueil Malmaison, France

Filed Sep. 21, 1981, Ser. No. 304,338

Claims priority, application France, Sep. 22, 1980, 80 20303

Int. Cl.³ C02F *3/18;* **B01F** *3/04*

U.S. Cl. 210—219 **29 Claims**



1. A waste water purification system comprising:

an aerator in the form of a cylinder, a first series of parallel blades on the surface of said cylinder and extending in directions nonparallel to the axis of said cylinder, and a second series of parallel blades on said surface of said cylinder and extending in directions nonparallel to said axis of said cylinder, said directions of said first series of blades being opposite to said directions of said second series of blades with respect to said axis;

means for mounting said aerator across a body of waste water to be treated, with a portion of said blades immersed in said water and with said axis extending horizontally, and for rotating said aerator about said axis;

said first and second series of blades intersecting each other, such that at any rotational speed of said aerator about said axis a constant portion of the total blade length of all of said blades of said aerator will be immersed in said waste water; and

each said blade being inclined with respect to said surface of said cylinder in a direction opposite to the direction of rotation.

18. A horizontal axis aerator for use in a waste water purification system and adapted to be mounted across and partially immersed in a body of waste water to be treated and rotated therein, said aerator comprising:

a cylinder having an axis and adapted to be mounted with said axis extending horizontally;

a first series of parallel blades on the surface of said cylinder and extending in directions nonparallel to said axis;

a second series of parallel blades on said surface of said cylinder and extending in directions nonparallel to said axis;

said directions of said first series of blades being opposite to

said directions of said second series of blades with respect to said axis;

said first and second series of blades intersecting each other, such that upon the aerator being partially immersed in a body of waste water to be treated and being rotated therein, at any rotational position of said aerator about said axis a constant portion of the total blade length of all of said blades of said aerator will be immersed in the waste water; and

each said blade being inclined with respect to said surface of said cylinder in a direction opposite to the direction of rotation.

4,539,113

FLUORORESIN FILTER

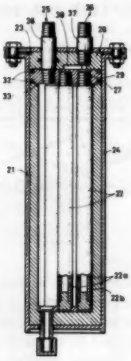
Kazuichi Tomita; Hiroshi Mano; Fumio Matsuyama, and Akihiko Isomura, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Jul. 9, 1984, Ser. No. 629,036

Claims priority, application Japan, Jul. 8, 1983, 58-125070; Mar. 3, 1984, 59-30979[U]

Int. Cl.³ B01D *29/30*

U.S. Cl. 210—323.2 **16 Claims**



1. A filter comprising:

a fluororesin container having a fluid inlet and a fluid outlet; and

a tubular filtering element arranged in said fluororesin container, said tubular filtering element comprising a polytetrafluoroethylene tubular filtering film closed at one end and placed over or inserted into a fluororesin tubular support.

4,539,114

ROTARY HORIZONTAL TABLE TYPE FILTER

Jean-Paul Mention, Saint-Clair du Rhone; Jean Aoustin, Rouen, and Bernard Wallon, Mont-Saint-Aignan, all of France, assignors to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Feb. 28, 1983, Ser. No. 470,302

Claims priority, application France, Mar. 2, 1982, 82 03382; Mar. 2, 1982, 82 03383

Int. Cl.³ B01D *35/12*

U.S. Cl. 210—330 **28 Claims**

1. A rotary horizontal table filter, comprising

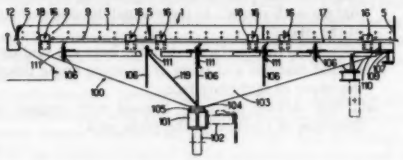
a rotatably driven carrier structure;

a circular horizontal filtration table supported on said structure;

the structure and the table being vertically separated so as to have a space thereinbetween;

means for connecting said table and said structure to provide at least one radial degree of freedom of movement of the table relative to the structure;

said connecting means being at least partially disposed in



said space and said connecting means comprises an assembly of a male element and a female element, respective ones of said elements being fixed to the table and the structure.

4,539,115

DEVICE FOR REMOVING CLEANING BALLS FROM A COOLING WATER STREAM

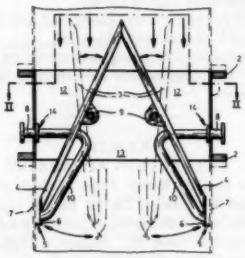
Dieter Patzig, Ratingen, Fed. Rep. of Germany, assignor to Taprogge Gesellschaft GmbH, Ratingen, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,685

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1983, 3303053

Int. Cl.³ B01D *29/42*; F28G *1/12*

U.S. Cl. 210—409 **12 Claims**



1. A device for recovering cleaning balls from a cooling water stream of a power plant condenser, having a pipeline and for use with a cleaning ball recirculating system, said device comprising:

a cylindrical pipe section forming a housing and provided with upstream and downstream flanges for connecting said housing to said pipeline;

at least one sieve pivotally mounted in said housing for displacement about an axis generally perpendicular to the direction of flow of said stream between an operative position wherein said sieve lies generally across said stream to collect cleaning balls therefrom, and an inoperative position, said sieve having a downstream end disposed downstream of and outside said pipe section in both said operative position and said inoperative position whereby said downstream end is located in a portion of said pipeline beyond said pipe section;

a ball collection part on said downstream end of said sieve cooperating with a wall portion independent of said housing and said pipe section and disposed downstream of a downstream one of said flanges to define a ball-collecting trough in said pipeline beyond said pipe section receiving balls captured from said stream in said operative position of said sieve;

a pipe fitting on said pipe section; and

a connecting pipe communicating between said pipe fitting

and said trough for withdrawing collected balls from said trough.

4,539,116

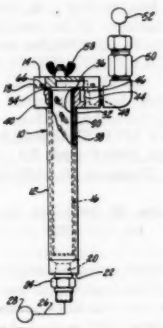
PAINT FILTER

Rolland L. Morin, 5550 Carleton Rockwood Rd., South Rockwood, Mich. 48179

Filed Aug. 15, 1983, Ser. No. 523,110

Int. Cl.³ B01D *29/10*

U.S. Cl. 210—445 **3 Claims**



1. A painting system comprising

means for supplying pressurized liquid paint,

a paint applicator,

a fluid line which fluidly connects the means supplying pressurized paint to the applicator,

a filter assembly comprising

an elongated housing defining an elongated housing chamber,

an elongated tubular filter element open at one end, said filter element being removably insertable into said housing chamber,

means for sealing the open end of said filter element to said housing,

means for fluidly connecting said housing chamber in line between said means supplying paint and said applicator so that one end of said housing chamber is open to said means supplying pressurized paint and so that the other end of said housing chamber is open to said paint applicator, said filter element being positioned fluidly between said ends of said housing chamber;

wherein said filter element includes an outwardly extending flange adjacent its open end, said housing comprising an elongated body and a cap removably secured to and enclosing said one end of said body, and said flange being sandwiched between said body and said cap; and

said assembly further comprising a fluid passageway formed in said body and open at one end to said one end of said body, and a channel formed in said cap, said channel extending between said one end of said passageway and said open end of said filter element.

4,539,117

METHOD FOR IMPROVING THE SEPARATING ACTION IN THE ULTRAFILTRATION OF AQUEOUS SOLUTIONS

Dieter Meyer, Düsseldorf; Christian Rossmann, Langenfeld, and Friedbert Zetzsche, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 31, 1981, Ser. No. 288,928

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047122

Int. Cl.³ B01D *13/00*

U.S. Cl. 210—639 **5 Claims**

1. A method for improving the separating action in the ultrafiltration of aqueous solutions containing water-soluble tensides selected from the group consisting of anionic, and non-ionic surface-active tensides, and mixtures thereof, and optionally other high-molecular-weight organic compounds consisting essentially of subjecting an aqueous solution containing water-soluble tensides selected from the group consisting of anionic, and non-ionic surface-active tensides, and mixtures thereof, and optionally other high-molecular-weight organic compounds to an ultrafiltration through a porous membrane in the presence of olefinically-unsaturated C_{16-22}-fatty acids or water-soluble salts thereof, in a weight ratio of said surface-active tensides to said fatty acid or salt of from 20:1 to 1:1, and recovering said aqueous solution substantially separated from said water-soluble tensides, and optionally other high-molecular-weight organic compounds.

4,539,118

RAPID, ACCURATE METHOD OF SEPARATION OF OXALATE FROM URINE AND OTHER BIOLOGICAL FLUIDS

Quincy E. Crider, Kirkwood, Mo., assignor to Sigma Chemical Company, St. Louis, Mo.

Filed Mar. 23, 1984, Ser. No. 592,950

Int. Cl.³ B01D *15/04*

U.S. Cl. 210—683 **20 Claims**

1. A method for separating oxalate from body fluids, which comprises:

(a) Mixing the body fluid with an adsorbent or a combination of adsorbents,

(b) Swirling the mixture and allowing the adsorbent to settle, discarding the supernatant,

(c) Washing the adsorbent by swirling with water, allowing the adsorbent to settle, discarding the supernatant,

(d) Adding alkali to the adsorbent, mixing, allowing the adsorbent to settle, and decanting the supernatant for use in analyzing for oxalate.

4,539,119

PROCESS FOR THE TREATMENT OF WASTE AND CONTAMINATED WATERS WITH IMPROVED RECOVERY OF ALUMINUM AND IRON FLOCCULATING AGENTS

Everett D. Cann, 5746 Forsythia Pl., Madison, Wis. 53705

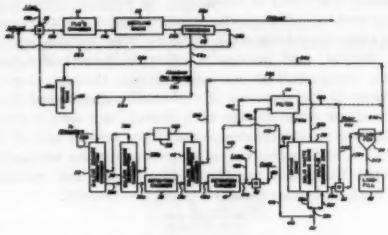
Filed Jul. 26, 1983, Ser. No. 517,434

Int. Cl.³ C02F *1/52*

U.S. Cl. 210—711 **7 Claims**

1. In a process for the treatment of domestic sewage and industrial waste waters containing suspended solids and phosphates wherein said solids are separated from said waste waters by introducing into said waste water a flocculating agent selected from the group consisting of the sulfates of iron and aluminum under neutral to weak acid conditions to effectively convert the flocculating agent to its hydroxide and thereby form a flocculating concentrate containing the hydroxide of said flocculating agent and said suspended solids, the improved method of recovering and recycling said flocculating agents and of disposing of said suspended solids which comprises: contacting said concentrate with at least one sulfur oxide gas in

an amount sufficient to convert the hydroxide of said flocculating agent to a member of the group consisting of sulfates, sulfites, and bisulfites and with oxygen in an amount sufficient to convert said sulphites and bisulfites to water soluble sulfates to thereby redissolve said flocculating agent, said contacting including contacting said concentrate countercurrently in a first sulfur dioxide absorption chamber with a flue gas comprising sulfur dioxide and air produced in a second sulfur dioxide absorption chamber at ambient temperatures to absorb substantially all the sulfur dioxide present in said flue gas into said concentrate, contacting the concentrate containing absorbed surlfur dioxide countercurrently in said second sulfur dioxide absorption chamber with a flue gas comprising sulfur dioxide, sulfur trioxide and air produced in a third sulfur dioxide absorption chamber to reduce the pH of said concentrate to about 1.0, passing said concentrate to a first retention chamber



for at least about 2 hours at ambient temperatures, contacting said concentrate countercurrently in said third sulfur dioxide adsorption chamber with a furnace flue gas stream containing sulfur dioxide, sulfur trioxide, and air, to raise the temperature of said concentrate to about 77° F., passing said concentrate to a second retention chamber for at least about 2 hours to complete the reaction of the sulfur dioxide with said concentrate, mixing said concentrate with an effective amount of lime and sulfur containing fuels to adjust the pH of said concentrate to about 4.5 and precipitate the phosphates of said flocculating agent, separating the resulting soluble flocculating agent from separated solids comprising said suspended solids, said phosphates, and said sulfur containing fuels, recycling said flocculating agent to said treatment process, and drying and burning said separated solids to form said furnace flue gas and disposable solids.

4,539,120

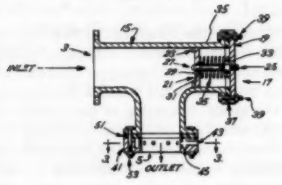
METHODS OF FLOCCULATING SOLIDS-BEARING AQUEOUS SUSPENSIONS

C. Douglas Robinson, St. Charles, Ill., assignor to U.S. Environmental Products, Inc., St. Charles, Ill.

Division of Ser. No. 399,759, Jul. 19, 1982, abandoned. This application May 31, 1984, Ser. No. 615,953

Int. Cl.³ B01D *21/01*

U.S. Cl. 210—738 **2 Claims**



1. A method of introducing a flocculant into a solids-bearing aqueous suspension flowing through a substantially unobstructed conduit, said flocculant causing said solids to aggregate into floccules, comprising the following steps:

(a) injecting the flocculant into a substantially unobstructed, angled flow passage zone substantially countercurrent to the flow of the aqueous suspension into the zone, the zone being defined by a housing attached to and in communication with the substantially unobstructed conduit, the housing comprising a pipe fitting having three orifices, the first orifice forming an inlet for the aqueous suspension, the second orifice forming an outlet for the aqueous suspension, the third orifice having a blind flange attached thereto through which the flocculant is injected into the pipe fitting by means of a pump, an injection tube and at least one spray nozzle, the pipe fitting connecting the inlet, the outlet, and the third orifice such that the inlet and the outlet are oriented at substantially a right angle with respect to each other and the inlet and the third orifice are oriented in a substantially colinear fashion with respect to each other; and

(b) introducing gas or liquid into the substantially unobstructed conduit by means of a sparger ring downstream from the zone to further mix the aqueous suspension and flocculant, the sparger ring being attached to the outlet such that the sparger ring is in communication with the conduit, the diameter of the interior of the sparger ring being substantially equal to the interior diameter of the conduit.

4,539,121

BAY MUD STABILIZATION

Mitchell A. Kapland, 3000 Friends Rd., Annapolis, Md. 21401, and Melville W. Robinson, Jr., 338 River Rd., Beaver, Pa. 15009

Filed Jan. 18, 1984, Ser. No. 571,801

Int. Cl.³ C02F *11/14*

U.S. Cl. 210—751 **1 Claim**

1. A process for converting aqueous bay mud sludge into a sedentary mass having load supportive properties, and low water permeability characteristics consisting essentially of

(a) partially dewatering bay mud sludge containing about 2–15 weight percent solids to a solids content of between 15 to 50 percent by weight, said solids comprising, in combination, greater than about 75 weight percent silica, alumina and iron;

(b) admixing with said partially dewatered sludge of (a) between 5 to 30 percent by weight, based on the solids content of said partially dewatered sludge, of finely ground granulated blast furnace slag comprising 30–40 percent SiO_2, 40–45 percent CaO, 10–20 percent Al_2O_3, 3–10 percent MgO, 1–3 percent S, 0.3–3 percent MnO, 0.3% Fe_2O_3 and a trace of phosphorous, said finely ground granulated blast furnace slag having a Blaine particle size of about 1,800–6,000 sq.cm./g;

(c) basifying the mixture from (b) with lime to a pH between 10.5 and 12.5 and

(d) maintaining the basified mixture from (c) in a substantially quiescent state for a period of time sufficient to effect stabilization of said sludge so as to produce a sedentary mass having load supportive properties ranging from 1.2–2.5 tons per square foot and a water permeability ranging from 1.9×10^{-6} cm^2/sec to 2.3×10^{-6} cm^2/sec.

4,539,122

CORROSION INHIBITOR FOR HEAVY BRINES

Adelina J. Son, and Mark S. Kuzlik, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

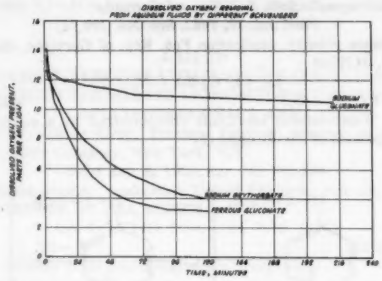
Filed Feb. 21, 1984, Ser. No. 581,932

Int. Cl.³ E21B *33/13, 43/11, 43/00*

U.S. Cl. 252—8.55 R **16 Claims**

1. A method of inhibiting corrosion of ferrous metals in contact with heavy brine solutions containing at least one heavy salt selected from the group consisting of potassium

halides, sodium halides, calcium halides and zinc halides, said solutions having a density in excess of about 10 lbs/gallon comprising admixing with said brine solution a corrosion inhibitor comprising a monovalent or divalent salt of erythorbic acid, said inhibitor being present in an amount of at least about 0.1 pound per barrel of said brine solution.



4,539,123

PROCESS FOR PRODUCTION LIQUID FABRIC CONDITIONERS

Wolfgang Bechstedt, Langenfeld, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,808

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340033

Int. Cl.³ D06M *13/20, 13/26*

U.S. Cl. 252—8.8 **20 Claims**

1. A process for the production of a homogeneous, liquid, fabric conditioner comprising the steps of:

dissolving maleic acid in prewarmed water;

adding phosphoric acid;

stirring the resulting solution while adding urea; and

continuing stirring while adding at least one nonionic surfactant to complete said conditioner production.

4,539,124

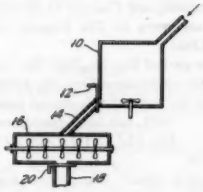
LUBRICATING SYSTEM COMPOSITION FOR EXTRUSION OF POLYVINYL CHLORIDE RESIN BINDER

Anthony V. Butcher, Liphook, and Brian W. Hatt, Speen, both of England, assignors to Elkem a/s, Oslo, Norway

Filed Feb. 10, 1984, Ser. No. 578,828

Int. Cl.³ C10M *1/50*

U.S. Cl. 252—28 **19 Claims**



1. A lubricating system composition for use in polyvinyl chloride resin compounds for the extrusion of products which comprises at least about 5 parts by weight for each 100 parts by weight of polyvinyl chloride resin of finely divided silica fume particles said silica particles having a surface area between about 15 to about 30 m^2/g, at least about 60% by weight of said silica particles being less than about 1μ in size and said silica particles having a real density between about 2.1 to about 2.3 g/cm^3 treated with at least about 0.25 parts by weight for each 100 parts by weight of silica fume particles of one or more polyvinyl chloride extrusion compound lubricants.

4,539,125

WATER-BASED METAL-WORKING FLUID

Mikio Sato, Ichihara, Japan, assignor to Idemitsu Kosan Company, Japan

Filed Nov. 18, 1983, Ser. No. 553,067

Claims priority, application Japan, Nov. 30, 1982, 57-208636; Dec. 3, 1982, 57-212390; Feb. 7, 1983, 58-17426

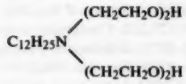
Int. Cl.³ C10M *1/48, 3/42, 5/24, 7/46*

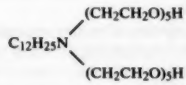
U.S. Cl. 252—32.7 E **3 Claims**

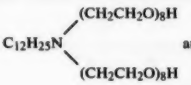
1. A method of inhibiting a water-based metal-working fluid from spoilage which comprises including in the water-based metal-working fluid the combination of:

(A) a mineral oil,

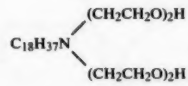
(B) a spoilage inhibiting compound selected from the group consisting of the compounds represented by the formulae:



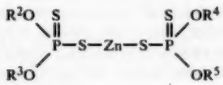




and



and (C) a phosphorous compound selected from the group consisting of the compounds represented by the formula:



wherein R^2, R^3, R^4 and R^5 are sec.-alkyl groups containing 6 carbon atoms.

4,539,126

BORATED BASIC METAL SALT AND LUBRICATING OIL COMPOSITION

Jan J. Bleeker; Martin Booth; Madeline G. F. M. van Grieken; Wilhelmus J. Krijnen, and Gerhard D. van Wijngaarden, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 15, 1984, Ser. No. 671,707

Claims priority, application United Kingdom, Nov. 15, 1983, 8330441

Int. Cl.³ C10M *1/54*

U.S. Cl. 252—39 **4 Claims**

1. An oil soluble reaction product of the reaction of an oil soluble basic magnesium or calcium salt of an organic acid consisting essentially of a magnesium or calcium C_{8-30} alkyl salicylate and a boron compound selected from the group consisting of ortho boric acid, meta boric acid and tetra boric acid, wherein said reaction is effected at a temperature of from

about 20° to about 200° C. and at a mole ratio of said boron to said magnesium or calcium C_{8-30} alkyl salicylate of between 0.1 to 10.

4,539,127

HYDROXYAMIDE ACID PRODUCTS AND BUTYROLACTONE AND BUTYROLACTAM PRODUCTS

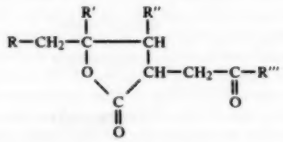
El-Ahmadi I. Heiba, Princeton, and Albert L. Williams, Hopewell Township, Mercer County, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 36,269, May 4, 1979, Pat. No. 4,329,286, which is a division of Ser. No. 618,173, Sep. 30, 1975, Pat. No. 4,190,588, Continuation-in-part of Ser. No. 355,360, Apr. 27, 1973, Pat. No. 3,925,232, Continuation-in-part of Ser. No. 212,626, Dec. 27, 1971, abandoned. This application Feb. 3, 1982, Ser. No. 345,505

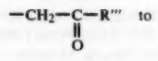
Int. Cl.³ C10M *3/42, 3/26;* **C07D** *207/412*

U.S. Cl. 252—47.5 **5 Claims**

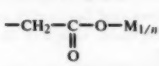
1. A novel composition of matter consisting essentially of a lactam salt obtained by reacting in liquid phase a substituted gamma-butyrolactone acetic acid compound derived from a polyisobutylene-maleic anhydride adduct and having the composition



wherein R, R′ and R″ are each selected from the group consisting of hydrogen, an alkyl group, and an alkenyl group, the total carbon atoms contained in R, R′ and R″ being from 25 to about 800, and wherein R‴ is selected from the group consisting of —OH, $—OR_a$, and $—SR_a$ wherein R_a is an alkyl substituent with one to twenty carbon atoms, with a metal compound and an amine in either order, said metal compound being selected from the group consisting of the carbonate, bicarbonate, hydride and alkoxide of an alkali or alkaline earth metal, said metal compound being reacted under conditions effective to convert said



to



wherein M is said metal and n is its valence, said amine being selected from the group consisting of alkyl amines, cycloalkyl amines, aralkyl amines and alkylene polyamines, said amine having from 1 to about 30 carbon atoms and containing an $—NH_2$ group and reacted at about 175° C. to about 275° C. for a time effective to replace the infrared band at 1775 cm^{-1} by the lactam band at 1770 cm^{-1}.

4. An organic composition comprising a major proportion of an organic lubricant and a minor proportion sufficient to provide detergent properties thereto of the product of claim 1.

4,539,128

WATER-SOLUBLE LUBRICANT

Max Grossmann, Frankfurt am Main, and Rainer Helwerth, Eschborn, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

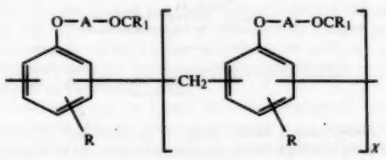
Filed Jul. 19, 1982, Ser. No. 399,711

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129244

Int. Cl.³ C10M *1/20, 1/26*

U.S. Cl. 252—49.3 **4 Claims**

1. Water-soluble lubricants characterized by a content of compounds of the formula (1)



(1)

wherein R is selected from the group consisting of hydrogen, C_1–C_{12}alkyl and C_1–C_{12}alkenyl, R_1 is selected from the group consisting of C_1–C_{18} alkyl and C_2–C_{18} alkenyl, A is alkylene oxide of the formula selected from the group consisting of

$$—(CH_2CH_2O)_m, —(C_3H_6O)n—$$

and combinations thereof; X is a number from 0 to 15 and the numerals for m and n are chosen such that the total content of said alkylene oxide in the molecule amounts to 10 to 800 alkylene oxide units.

4,539,129

BARIUM FERRITE PARTICLES AND PROCESS FOR PRODUCING SAID PARTICLES

Norimichi Nagai; Nanao Horiishi, both of Hiroshima; Masao Kiyama, and Toshio Takada, both of Kyoto, all of Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Filed Aug. 23, 1983, Ser. No. 525,642

Claims priority, application Japan, Aug. 31, 1982, 57-152448

Int. Cl.³ C04B *35/26*

U.S. Cl. 252—62.63 **13 Claims**

1. Barium ferrite particles in a form of plate-like having a specific surface area of 0.5 to 5.0 m^2/g, a maximum magnetization of 35 to 60 emu/g and a coercive force of not more than 1,000 Oe.

4,539,130

PEROXYGEN BLEACH ACTIVATORS AND BLEACHING COMPOSITIONS

James E. Thompson, and Charles D. Broaddus, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

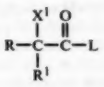
Continuation-in-part of Ser. No. 564,786, Dec. 22, 1983, Pat. No. 4,483,778. This application Oct. 30, 1984, Ser. No. 666,415

The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.

Int. Cl.³ C11D *7/38, 7/54*

U.S. Cl. 252—94 **16 Claims**

1. A peroxygen bleach activator comprising a mixture of compounds of the general formula



where R is a straight or branched chain alkyl or alkenyl containing from about 4 to about 14 carbon atoms, R^1 is H, $—CH_3$,

—C_2H_5 or —C_3H_7, L is a leaving group the conjugate acid of which has a pKa of about 4 to about 30, and X^1 is H, Cl, OCH_3 or OC_2H_5 such that the weight ratio of substituted compounds wherein $X^1 = OCH_3$ OC_2H_5 or Cl to unsubstituted compounds wherein $X^1 = H$ is from about 1:9 to about 9:1.

4,539,131

SOLID DETERGENT COMPOSITION CONTAINING SODIUM PERBORATE MONOHYDRATE HAVING SPECIFIED SURFACE AREA

Peter F. Garner-Gray, Preston, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Jun. 6, 1983, Ser. No. 501,586

Claims priority, application United Kingdom, Jun. 25, 1982, 8218537; Sep. 24, 1982, 8227308

Int. Cl.³ C11D *7/54, 7/14, 7/18, 3/395*

U.S. Cl. 252—99 **11 Claims**

1. A solid detergent composition comprising:

(a) from 6 to 40% of a detergent active material;

(b) from 5 to 60% of an alkalimetal aluminosilicate material as a detergency builder;

(c) from 2 to 50% of sodium perborate monohydrate having the empirical formula:

$$NaBO_2 \cdot H_2O_2$$

in particulate form having a specific surface area of at least 5.89 m^2/g.

4,539,132

BLEACHING AND CLEANING COMPOSITION

John Oakes, Ellesmere Port, England, assignor to Lever Brothers Company, New York, N.Y.

Filed May 3, 1984, Ser. No. 606,724

Claims priority, application United Kingdom, May 4, 1983, 8312185

Int. Cl.³ C11D *7/18, 7/42*

U.S. Cl. 252—95 **10 Claims**

10. An alkaline bleaching and cleaning agent having improved bleaching and cleaning capacity at all washing temperatures and especially at lower temperatures, comprising:

(i) from 2 to 50% by weight of a detergent-active material, selected from the group consisting of organic anionic, nonionic, amphoteric and zwitterionic detergents and soaps, and mixtures thereof;

(ii) from 15 to 60% by weight of a detergency builder salt;

(iii) from 4 to 35% by weight of a peroxide compound bleach;

(iv) from 0.001 to 10% by weight of a proteolytic enzyme; and

(v) from 0.005 to 5% by weight of manganese (II) metal ion. such that the composition has a solution pH of from 8–13 and a proteolytic activity of from 2 to 20 Anson Units per kilogram.

4,539,133

PROCESS FOR PREPARATION OF AN ANTI-CORROSIVE AQUEOUS LIQUID DETERGENT COMPOSITION

Jelles V. Boskamp, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Feb. 29, 1984, Ser. No. 584,670

Claims priority, application United Kingdom, Mar. 2, 1983, 8305790

Int. Cl.³ C11D *9/10*

U.S. Cl. 252—109 **7 Claims**

1. Process for the preparation of a neutral or low-alkaline silica-containing aqueous liquid detergent composition, comprising the step of admixing particulate alkalimetal silicate into the aqueous detergent base at a temperature of below 50° C., said detergent base comprising from 5 to 25% by weight of a soap and/or synthetic detergent and from 5 to 40% by weight of a detergency builder.

4,539,134

METHODS AND CLEANING COMPOSITIONS FOR REMOVING ORGANIC MATERIALS FROM METALLIC SURFACES

Larry D. Martin, Al Khobar, Saudi Arabia, and Paul S. Brown, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 2, 1982, Ser. No. 446,304

Int. Cl.³ C11D *1/78*

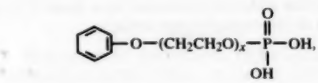
U.S. Cl. 252—156 **8 Claims**

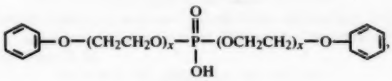
1. A method of removing oil, grease and other organic materials from metallic surfaces comprising:

contacting said metallic surfaces for a period of time sufficient to remove the materials with an aqueous composition comprising:

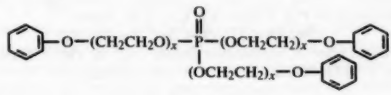
(a) an alkaline material selected from the group consisting of alkali metal hydroxide, ammonium hydroxide, an alkali metal carbonate, an alkali metal silicate, an alkali metal phosphate, tetrasodium EDTA and mixtures thereof;

(b) a wetting agent selected from the group consisting of aromatic phosphate esters of the formulae:





and



and mixtures of such phosphate esters wherein x has a value in the range of from about 4 to about 6; and,

(c) a nonionic surface active agent comprising nonylphenolethoxylate havng an ethylene oxide content in the range of from about 12 to about 13 units of ethylene oxide per molecule.

4,539,135

PERFUME-CONTAINING CARRIER FOR LAUNDRY COMPOSITIONS

Pallassana Ramachandran, Robbinsville, and Paul S. Grand, Highland Park, both of N.J., assignors to Colgate Palmolive Co., New York, N.Y.

Filed Jun. 1, 1983, Ser. No. 499,926

Int. Cl.³ C11D *17/06, 9/44;* **A61K** *7/46;* **C11B** *9/00*

U.S. Cl. 252—174.11 **16 Claims**

1. A particulate laundry detergent composition comprising:

(a) from about 0.1 to about 50%, by weight, of a perfume-containing carrier consisting essentially of (i) discrete particles containing at least about 90%, by weight, of a smectite-type clay and/or a zeolite, and less than about 5%, by weight, of surface active detergent compounds; and (ii) a perfume;

(b) from about 2 to about 50%, by weight, additional to any detergent compound in said particles, of one or more surface active detergent compounds selected from the group consisting of anionic, nonionic, cationic, ampholytic and zwitterionic detergents;

(c) from about 0 to about 70%, by weight, of a detergent builder salt;

(d) the balance comprising water and optionally a filler salt.

4,539,136

PROCESS FOR THE PREPARATION OF BRANCHED POLYMERS

Antonius A. Broekhuis, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 16, 1984, Ser. No. 571,322

Claims priority, application United Kingdom, Sep. 28, 1983, 8326014

Int. Cl.³ C08F *297/04*

U.S. Cl. 525—250 5 Claims

1. A process for the preparation of a branched polymer which comprises contacting a monovinyl aromatic monomer having from 8 to 18 carbon atoms per molecule with an organolithium initiator, thereafter adding at least one conjugated diene monomer having from 4 to 12 carbon atoms per molecule and thereafter adding a phosphite triester as coupling agent, wherein the phosphite triester is a tri(mixed mono- and dinonyl phenyl) phosphite added in an amount from about 0.15 to 1.1 mole per mol of the organolithium initiator.

4,539,137

PROCESS FOR THE PREPARATION OF PHOSPHOR

Katsuhiro Kohda, and Kenji Takahashi, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 17, 1984, Ser. No. 661,615

Claims priority, application Japan, Oct. 24, 1983, 58-198757; Nov. 7, 1983, 58-208729; Nov. 7, 1983, 58-208730

Int. Cl.³ C09K *11/475*

U.S. Cl. 252—301.4 H 22 Claims

1. A process for the preparation of a cerium activated rare earth oxyhalide phosphor having the following formula:

$$LnOX:xCe$$

in which Ln is at least one rare earth element selected from the group consisting of Y, La, Gd and Lu; X is at least one halogen selected from the group consisting of Cl, Br and I; and x is a number satisfying the condition of $0<x\leqq0.1$, which comprises:

adding to a mixture of starting materials for the phosphor or a heat-treated product of said mixture the heat treatment being effected at 300° to 500° C. at least one compound selected from the group consisting of tetrafluoroboric acid compounds, hexafluorosilicic acid compounds and metal fluorides in an amount of not more than 100% by weight per the amount of said mixture or said heat-treated product thereof to mix them; and

firing the so obtained mixture at a temperature of from 900° to 1500° C., wherein said at least one compound is present in an amount sufficient to effect a cerium activated rare earth oxyhalide phosphor having the above formula, exhibiting a higher luminance of stimulated emission upon excitation with an electromagnetic wave having a wavelength within the region of 450 to 900 nm after exposure to X-ray radiation, than said phosphor prepared as above, absent said compound.

4,539,138

PHOSPHOR

Junji Miyahara; Takashi Nakamura, and Kenji Takahashi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Continuation of Ser. No. 466,654, Feb. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 394,300, Jul. 1, 1982, abandoned, which is a continuation of Ser. No. 277,830, Jun. 26, 1981, abandoned, which is a continuation of Ser. No. 152,631, May 23, 1980, abandoned. This application Mar. 12, 1984, Ser. No. 591,224

Claims priority, application Japan, May 25, 1979, 54-64622

Int. Cl.³ C09K *11/46, 11/465*

U.S. Cl. 252—301.4 H 3 Claims

1. A rare earth element activated divalent metal fluorohalide phosphor represented by the formula

$$M^{II}FX.xSiO_2:yLn$$

wherein M^{II} is at least one divalent metal selected from the group consisting of Ba, Ca, Sr, Mg, Zn and Cd; Ln is at least one rare earth element selected from the group consisting of Eu, Tb, Ce, Tm, Dy, Pr, Ho, Nd, Yb, Er, Sm and Gd; X is at least one halogen selected from the group consisting of Cl, Br and I; and x and y are numbers satisfying the conditions of $10^{-5}\leqq x\leqq0.3$ and $0<y\leqq0.2$, respectively, and exhibiting a faster decay of afterglow than said phosphor, absent SiO_2.

4,539,139

PROCESS FOR THE PREPARATION OF OIL-IN-WATER EMULSIONS

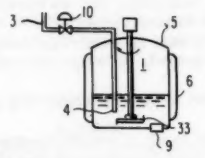
Yasunori Ichikawa; Shigeru Yamaguchi; Akira Kojima, and Kazuhiko Fujiwara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 7, 1984, Ser. No. 607,473

Claims priority, application Japan, May 6, 1983, 58-79105

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—314 4 Claims



1. A process for preparing an oil-in-water emulsion which comprises the steps of:

adding a mixture of a hydrophobic substance and an emulsifying agent directedly or after being dissolved in an organic solvent by heating in a dissolving-emulsifying tank equipped with a high-speed agitation type dispersing means, to form a hydrophobic substance solution as an oil phase,

introducing water and/or an aqueous solution of gelatin into the tank under the hydrophobic substance solution through a submerged inlet and stirring the resulting mixture to form a water-in-oil emulsion, and

detecting a timing of the phase inversion by an electric conductivity meter, and upon detection, interrupting the further addition of the water and/or the aqueous solution of gelatin and, thereafter, again conducting the addition of the water and/or the aqueous solution of gelatin to achieve stabilization of the emulsion.

4,539,140
MIXTURES OF NON-HALOGEN SALTS OF NITROGEN HETEROCYCLICS AND NITROGEN-SULFUR HETEROCYCLICS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 200,817, Oct. 27, 1980,. This application Mar. 12, 1984, Ser. No. 588,639

Int. Cl.³ C23F *11/04*; C09K *31/00*

U.S. Cl. 252—391 **12 Claims**

1. A corrosion inhibiting composition of matter comprising a mixture of non-halogen salts of nitrogen heterocyclics and nitrogen-sulfur heterocyclics where the nitrogen heterocyclics are selected from phenanthridines, tetrahydropyrimidines, pyridines, dihydropyridines and mixtures thereof and the sulfur-nitrogen heterocyclics are selected from thiazoles and thiazolenes and mixtures thereof.

4,539,141
MICROCOMPOSITE OF METAL CARBIDE AND CERAMIC PARTICLES

Milivoj K. Brun, Ballston Lake; Minyoung Lee, and Lawrence E. Szala, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 529,783, Sep. 6, 1983, Pat. No. 4,515,746. This application Jul. 13, 1984, Ser. No. 630,905

Int. Cl.³ C04B *35/56*

U.S. Cl. 252—516 **11 Claims**

1. An electrically conducting polycrystalline microcomposite consisting essentially of a continuous interconnecting phase of a carbide of a metal selected from the group consisting of hafnium, niobium, tantalum, titanium, vanadium, zirconium and mixtures thereof and a phase consisting essentially of ceramic particles, said continuous metal carbide phase encapsulating at least about 20% by volume of said phase of ceramic particles and encapsulating or being intermixed with the balance of said ceramic particles, said metal carbide phase having an average grain size of less than about 15 microns, said ceramic particles having an average particle size of less than about 15 microns and consisting essentially of ceramic grains and clusters of grains, all of said encapsulating metal carbide phase encapsulating individual ceramic grains and/or individual clusters of grains, said microcomposite having a density greater than 95% of the theoretical density for said microcomposite, said continuous metal carbide phase ranging from about 20% by volume to about 80% by volume of said microcomposite.

4,539,142
4-(2-BORNYLOXY)-2-BUTYN-1-OL AND ORGANOLEPTIC USES THEREOF

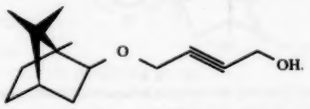
Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 574,150, Jan. 26, 1984, Pat. No. 4,521,634, which is a continuation-in-part of Ser. No. 533,915, Sep. 19, 1983, , which is a continuation-in-part of Ser. No. 507,292, Aug. 1, 1983, abandoned. This application Apr. 26, 1984, Ser. No. 604,230

Int. Cl.³ A61K *7/46*; C07C *5/23*

U.S. Cl. 252—522 R **7 Claims**

1. The 4-(2-bornyloxy)-2-butyn-1-ol having the structure:



2. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of intimately admixing with said consumable material an aroma augmenting or enhancing quantity of the 4-(2-bornyloxy)-2-butyn-1-ol defined according to claim 1.

4,539,143
NORBORNYL PYRIDINE DERIVATIVES, ORGANOLEPTIC USES OF SAME, AND THE PROCESSES FOR PREPARING SAME

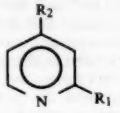
Richard M. Boden, Ocean, and Claude Grim, Keansburg, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Feb. 23, 1984, Ser. No. 582,756

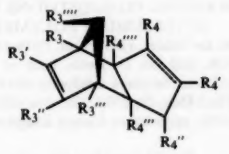
Int. Cl.³ C07D *31/20*; C11B *9/00*

U.S. Cl. 252—522 R **8 Claims**

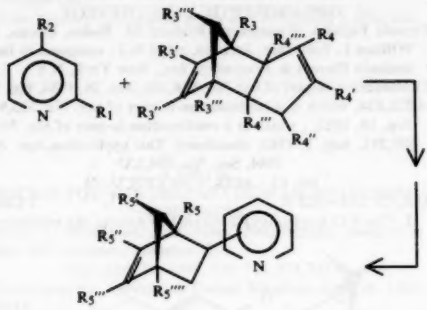
1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of at least one product produced according to the process of intimately admixing a compound defined according to the structure:



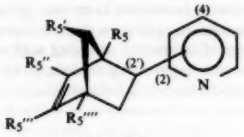
wherein one of R_1 or R_2 is vinyl and the other R_1 or R_2 is hydrogen with the compound having the structure:



wherein one of R_3, R_3', R_3'', R_3''' and R_3'''' is methyl and the other of R_3, R_3', R_3'', R_3''' and R_3'''' represents hydrogen and wherein one of R_4, R_4', R_4'', R_4''' and R_4'''' represents methyl and the other of R_4, R_4', R_4'', R_4''' and R_4'''' represents hydrogen and heating the resulting mixture to reflux whereby the reaction:

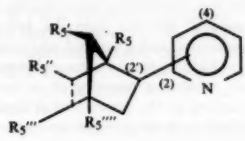


is carried out, thereby forming a mixture of compounds defined according to the structure:



wherein one of R_5, R_5', R_5'', R_5''' and R_5'''' is methyl and the other of R_5, R_5', R_5'', R_5''' and R_5'''' is hydrogen.

2. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of at least one pyridinyl derivative defined according to the structure:



wherein R_5, R_5', R_5'', R_5''' and R_5'''' represent hydrogen or methyl; wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond; and wherein the norbornyl moiety is bonded to the pyridinyl moiety at the 2' position of the norbornyl moiety and the 2 or the 4 position of the pyridinyl moiety; with the proviso that the substance added to the consumable material is a mixture when one of R_5, R_5', R_5'', R_5''' or R_5'''' is methyl.

4,539,144

DISHWASHING COMPOSITIONS WITH AN ANTI-FILMING POLYMER

Johannes J. M. de Ridder, Hilversum, Netherlands; Michael W. Hollingsworth, and Ian D. Robb, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 20, 1982, Ser. No. 450,944

Claims priority, application United Kingdom, Dec. 23, 1981, 8138735

Int. Cl.³ C11D *1/08, 3/08*

U.S. Cl. 252—526 **4 Claims**

1. A machine dishwashing or rinsing composition being substantially free from anionic detergents and having a very low or zero phosphate content, which comprises:

(a) from 5-50% by weight of a calcium sequestering agent selected from the group consisting of water-soluble citrate salts, water nitrilotriacetic acid salts, water-soluble carboxymethyloxy succinic acids salt, zeolites, ethane-1,1-dihydroxyphosphonic acid salts, ethylenediamine tetraphosphonic acid salts and ethylenediamine tetraacetic acid salts;

(b) from 0.05–5% by weight of hydrolyzed polymaleic anhydride having an average molecular weight of about 2,500;

(c) up to 5% by weight of a nonionic detergent surfactant; and

(d) an alkaline detergent material selected from the group consisting of alkali metal hydroxides, alkali metal borates, alkali metal disilicates, alkali metal silicates having an alkali metal: SiO_2 ratio of 1:3.4, and alkali metal carbonates; the weight ratio between said sequestering agent and said hydrolyzed polymaleic anhydride being between 1:1 and 100:1.

4,539,145

OUTSIDE WINDOW CLEANER CONTAINING POLYVINYL ALCOHOL AND AMINE-CONTAINING POLYMER

Vincent E. Alvarez, Livermore, and David L. Conkey, San Ramon, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Sep. 15, 1983, Ser. No. 532,635

Int. Cl.³ C11D *1/38, 1/66, 3/37, 17/08*

U.S. Cl. 252—542 **7 Claims**

1. A composition for cleaning and altering hard surfaces such that water used to rinse said hard surface drains off in uniform sheets without leaving significant residue or spotting after rinsing comprising:

(a) No more than about 10% of at least one polyvinyl alcohol having average molecular weight of about 22,000 to 400,000;

(b) At least 80.0% water;

(c) About 0.0001 to 10.0% of a cationic or nonionic surfactant to add detergency to the composition without deleteriously affecting the sheeting action of rinse water from said hard surface; and

(d) A polymer containing at least one primary or secondary amino functional group, said polymer being selected from the group consisting essentially of trimethylol melamine, dimethyl ethylene urea, triazone resins and dialdehydes, wherein said polymer of (d) and said polyvinyl alcohol of (a) are present in a ratio of about 15:1 to 1:15.

4. A method of cleaning hard surfaces without leaving significant residue or spotting after rinsing, comprising:

applying to a hard surface a cleaning composition which comprises:

(a) No more than about 10% of at least one polyvinyl alcohol having average molecular weight of about 22,000 to 400,000;

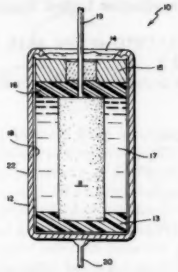
(b) at least 80.0% water; and

(c) a polymer containing at least one primary or secondary amine functional group, said polymer being selected from the group consisting essentially of trimethylol-melamine, dimethyl ethylene urea, triazone resins and dialdehydes, wherein said polyer of (c) and said polyvinyl alcohol of (a) are present in a ratio of about 15:1 to 1:15.

4,539,146
ELECTROLYTE FOR ELECTROLYTIC CAPACITORS

Brian Melody, Greencastle, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Aug. 13, 1984, Ser. No. 639,749
Int. Cl.[3] H01G 9/00
U.S. Cl. 252—62.2 5 Claims



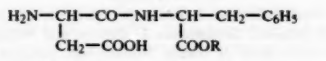
1. An electrolyte consisting of a liquid solution of from about 3.0 to about 4.5 mol/lit sulfuric acid and from about 0.05 to about 0.30 mol/lit boric acid.

4,539,147
PROCESS FOR PREPARING ALPHA-L-ASPARTYL-L-PHENYLALANINE ALKYL ESTERS

Andrea Filippini, Prato, and Renato Carobbi, Pistoia, both of Italy, assignors to Sirac SpA, Milan, Italy

Filed Dec. 7, 1982, Ser. No. 447,715
Claims priority, application Italy, Sep. 2, 1982, 23096 A/82
Int. Cl.[3] C07C 103/52
U.S. Cl. 260—112.5 R 2 Claims

1. A process for preparing alpha-L-aspartyl-L-phenylalanine alkyl esters of formula:



(I)

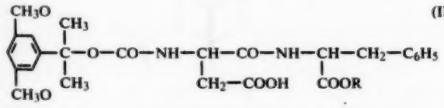
in which R is C_1–C_6 alkyl wherein

(a) aspartic acid is reacted with 3,5-dimethoxy-α,α-dimethyl-benzyloxycarbonyl-azide in an anhydrous environment;

(b) the resultant 3,5-dimethoxy-α,α-dimethyl-benzyloxy-carbonyl aspartic acid is reacted with acetic anhydride in excess to give the corresponding anhydride;

(c) the protected aspartic anhydride is reacted with the L-phenylalanine alkyl ester in tetrahydrofuran solvent at ambient temperature; and

(d) the resultant compound of formula:



(III)

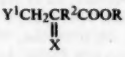
is subjected to an operation in which the protective group is split by the action of U.V. radiation on a solution of the product in tetrahydrofuran solvent at 10°–15° C.

4,539,148
PRODUCTION OF 1-OXACEPHAMS AND INTERMEDIATES

Sadao Yamamoto, Hyogo; Hikaru Itani, Osaka; Hiromi Takahashi, Hyogo; Teruji Tsuji, Osaka, and Wataru Nagata, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Aug. 16, 1983, Ser. No. 523,414
Claims priority, application Japan, Aug. 24, 1982, 57-147268
Int. Cl.[3] C07D 205/08, 487/04, 309/12, 403/12
U.S. Cl. 260—239 A 3 Claims

1. A 4-oxygenated butyric acid derivative of the formula



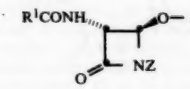
wherein

R is carboxy protecting group;

R^2 is (1) methylene, (2) hydroxyiminomethylene, (3) hydroxyiminomethylene protected by tri-C_1 to C_5-alkylsilyl, 1-C_1 to C_5-alkoxy-C_1 to C_5-alkyl, tetrahydrofuranyl or tetrahydropyranyl, or (4) diazomethylene;

X is methylene; and

Y^1 is a group of the formula



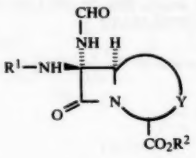
in which R^1 is (1) C_1 to C_{10}-alkyl which is unsubstituted or substituted by phenoxy (2) benzyl, (3) phenyl, (4) methylphenyl, (5) dimethylphenyl, (6) cyanophenyl, (7) nitrophenyl, (8) methoxyphenyl or (9) chlorophenyl and Z is hydrogen or a N-protecting group from the group of C_1 to C_5-alkanoyl and tri-C_1 to C_5-alkylsilyl.

4,539,149
β-LACTAM ANTIBACTERIAL AGENTS

Peter H. Milner, Horsham, England, assignor to Beecham Group p.l.c., England

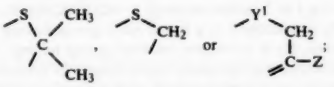
Filed Jul. 23, 1982, Ser. No. 401,266
Claims priority, application United Kingdom, Jul. 25, 1981, 8123033; Jul. 25, 1981, 8123034; Dec. 7, 1981, 8136823; Dec. 7, 1981, 8136824; Mar. 18, 1982, 8207966; Apr. 3, 1982, 8209953; Apr. 3, 1982, 8209954; May 22, 1982, 8215007
Int. Cl.[3] C07D 499/50, 499/54, 501/24
U.S. Cl. 260—239.1 34 Claims

1. A compound of formula (I):



(I)

or a salt thereof wherein R^1 is hydrogen, an acyl group, or an amino-protecting group; R^2 is hydrogen or a readily removable carboxyl protecting group; and Y is:



wherein Y^1 is oxygen, sulphur or —CH_2— and Z represents hydrogen, halogen, alkoxy of 1 to 4 carbon atoms, —CH_2Q or

—CH=CH—Q wherein Q is hydrogen, halogen, hydroxy, mercapto, cyano, carboxy, carboxylic ester, alkoxy of 1 to 4 carbon atoms, acyloxy, aryl, a heterocyclyl group bonded via a carbon atom, a heterocyclylthio group or a nitrogen containing heterocyclic group bonded via a nitrogen atom.

4,539,150

BENZOTHIAZEPINE DERIVATIVES AND THEIR METHODS OF PREPARATION

Tsutomu Katakami; Nobuyuki Fukazawa, both of Yokohama; Hajime Iizuka, Hiratsuka; Takashi Nishina, and Isao Shirakawa, both of Mobara, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

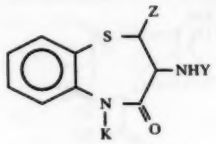
Filed Jun. 28, 1984, Ser. No. 625,656

Claims priority, application Japan, Jun. 29, 1983, 58-116177; Aug. 8, 1983, 58-143655; Sep. 27, 1983, 58-177001; Nov. 18, 1983, 58-216058

Int. Cl.³ C07D *281/02*

U.S. Cl. 260—239.3 B **9 Claims**

1. A benzothiazepine compound of the following formula



(I)

wherein K is hydrogen or a $—CH_2COOR_2$ group where R_2 is hydrogen or a lower alkyl having 1 to 4 carbon atoms; Z is hydrogen or phenyl when K is a $—CH_2COOR_2$ group, and is phenyl when K is hydrogen; and Y is hydrogen, a $—CH—R_3—COOR_1$ group, an alkanoyl group having 1 to 5 carbon atoms or a $—COO(CH_2)nR_4$ where R_1 is hydrogen or a lower alkyl having 1 to 4 carbon atoms, R_3 is hydrogen, an alkyl group having 1 to 10 carbon atoms, an aralkyl group being benzyl or phenethyl, or an aryl-lower alkyl group where aryl is tolyl or xylyl and the lower alkyl has 1 to 4 carbon atoms, and R_4 is an aryl group being phenyl, tolyl or xylyl and n is a whole number of 1 to 10.

4,539,151

BENZOTHIAZEPINE DERIVATIVES AND THEIR METHOD OF PREPARATION

Tsutomu Katakami; Nobuyuki Fukazawa, both of Yokohama, and Hajime Iizuka, Hiratsuka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

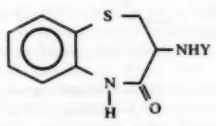
Filed Jun. 28, 1984, Ser. No. 625,815

Claims priority, application Japan, Jun. 29, 1983, 58-116179

Int. Cl.³ C07D *281/02*

U.S. Cl. 260—239.3 B **4 Claims**

1. A benzothiazepine compound of the following formula



(I)

wherein Y is hydrogen, a $CHR_3—COOR_1$ group, an alkanoyl group having 1 to 5 carbon atoms or a $—COO(CH_2)nR_4$ group wherein R_1 is hydrogen or a lower alkyl group having 1 to 4 carbon atoms, R_3 is hydrogen, an alkyl group having 1 to 10 carbon atoms, an aralkyl group being benzyl or phenethyl or an aryl-lower alkyl group where aryl is tolyl or xylyl and lower alkyl has 1 to 4 carbon atoms, R_4 is an aryl group being phenyl, tolyl or xylyl and n is a whole number of 1to 10.

4,539,152

4-SUBSTITUTED-2-OXOAZETIDINE COMPOUNDS

Masashi Hashimoto, Takarazuka; Matsuhiko Aratani, Daitoh, and Kozo Sawada, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

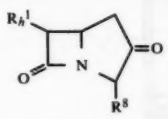
Continuation-in-part of Ser. No. 237,936, Feb. 25, 1981, abandoned, and a continuation-in-part of Ser. No. 296,840, Aug. 27, 1981, Pat. No. 4,383,945. This application Aug. 27, 1982, Ser. No. 412,263

Claims priority, application United Kingdom, Feb. 28, 1980, 8006842

Int. Cl.³ C07D *487/06*; A61K *31/40*

U.S. Cl. 260—245.2 T **4 Claims**

1. A carbapenam compound of the formula:



wherein R_A^1 is 1-hydroxy-1-methylethyl or 1-hydroxy-1-methylethyl protected by a removable hydroxy protecting group and R^8 is carboxy or carboxy protected by a removable carboxy protecting group and a pharmaceutically acceptable salt thereof.

4,539,153

METHOD OF PREPARING 1 α-HYDROXYVITAMIN D AND 1 α-HYDROXYPREVITAMIN D COMPOUNDS, AND ADDUCTS OF A PREVITAMIN D OR TACHYSTEROL COMPOUND WITH A SUITABLE DIENOPHILE

Maurits Vandewalle; Luc J. Vanmaele; Pierre J. De Clercq, all of Gent, Belgium; Sebastianus J. Halkes, and Wilhelmus R. M. Overbeek, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

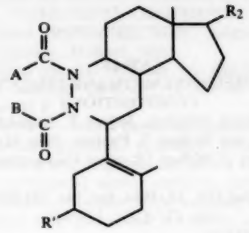
Continuation of Ser. No. 399,251, Jul. 19, 1982, abandoned. This application Jul. 31, 1984, Ser. No. 636,782

Claims priority, application Netherlands, Jul. 17, 1981, 8103393

Int. Cl.³ C07J *9/00*

U.S. Cl. 260—397.2 **34 Claims**

1. A method of preparing a 1α-hydroxyvitamin D or 1α-hydroxyprevitamin D compounds, characterized in that an adduct of a previtamin D compound and a dienophile, having the general formula:



in which:

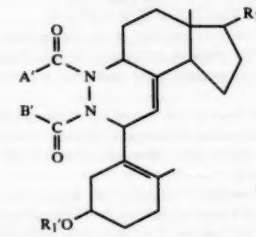
R_2 is a side chain derived from a compound selected from the group consisting of a previtamin D compound selected from the group consisting of previtamin D_3, 25-hydroxyprevitamin D_3, and 24,25-dihydroxyprevitamin D_3; the esterification product of a previtamin D compound selected from said group of previtamin D compounds and an esterification agent selected from the group consisting of alkylchlorocarbonates having 2 to 5 carbon atoms, aromatic carboxylic acids, saturated aliphatic carboxylic acids having 1 to 4 carbon atoms, p-toluenesulphonic acid, methane sulphonic acid, trifluoroacetic acid, and derivatives of said acids suitable for the esterification reaction; and the etherification product of a previtamin D compound selected from said group of previtamin D compounds and an etherification agent selected from the group consisting of triphenyl methyl halides, 2,3-dihydropyran, trialkylsilylhalides having 1 to 6 carbon atoms in the alkyl groups, and trialkylsilylethoxymethylhalides having 1 to 6 carbon atoms in the alkyl groups;

R^1 is selected from the group consisting of hydrogen, hydroxy, hydroxy esterified with an esterification agent selected from said group of esterification agents, and hydroxy etherified with an etherification agent selected from said group of etherification agents; and

A and B independently represent alkoxy having 1 to 4 carbon atoms or jointly constitute a substituent selected from the group consisting of phenylimino and o-phenylene;

is hydroxylated in the 1α-position by a reaction with an oxidant selected from the group consisting of chromic acid, pyridine dichromate, tert.-butylchromate, bis(tetrabutylammonium) dichromate, chromiumtrioxide-3,5-dimethylpyrazole complex, and selenium dioxides, followed by reduction with a reductant selected from the group consisting of metal hydrides and complex metal hydrides; and subsequently, after removal of any protective ester or ether groups present, the 1α-hydroxyvitamin D or 1α-hydroxyprevitamin D compound is isolated.

30. A method of preparing a compound selected from the group consisting of 1α-hydroxyvitamin D_3, 1α-hydroxyprevitamin D_3, 1α,25-dihydroxyvitamin D_3, 1α,25-dihydroxyprevitamin D_3, 1α,24,25-trihydroxyvitamin D_3 and 1α,24,25-trihydroxyprevitamin D_3, characterized in that an adduct of a previtamin D compound and a dienophile, having the general formula:



in which:

R_1 is a side chain derived from a previtamin D compound selected from the group consisting of previtamin D_3, 25-hydroxyprevitamin D_3, 24,25-dihydroxyprevitamin D_3, the etherification product of 25-hydroxyprevitamin D_3 and an etherification agent selected from the group consisting of tert.-butyl dimethylsilylchloride and trimethylsilylchloride, and the etherification product of 24,25-dihydroxyprevitamin D_3 and an agent selected from said group of etherification agents;

R_1' is selected from the group consisting of tert.-butyl dimethylsilyl and trimethylsilyl; and

A′ and B′ are the same and are selected from the group consisting of methoxy and ethoxy, or together constitute a substituent selected from the group consisting of phenylimino and o-phenylene;

is hydroxylated in the 1α-position by an oxidation reaction with an oxidant selected from the group consisting of chromic acid, pyridine dichromate and manganese dioxide, followed by reduction with the reaction product of lithium aluminum hydride and aluminum chloride, said adduct having been hydroxylated in the 1α-position prior to the oxidation reaction by reaction with a brominating agent selected from the group consisting of N-bromosuccinimide, N,N′-dibromodimethylhydantoin and N-bromophthalimide followed by hydrolysis; and subsequently, after removal of the tert.-butyl dimethylsilyl group or the trimethylsilyl group by means of treatment with a fluorine-containing compound or a mineral acid, respectively, and after removal of the dienophile group by means of treatment with potassium hydroxide in a lower aliphatic alcohol, the 1α-hydroxyvitamin D or 1α-hydroxyprevitamin D compound is isolated.

4,539,154

POLYENE COMPOUNDS

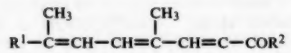
Ernst P. Krebs, Bottmingen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 15, 1983, Ser. No. 504,554

Int. Cl.[3] **C11C** *3/02*

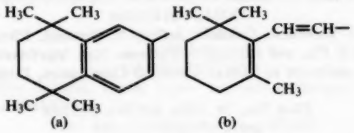
U.S. Cl. 260—410.9 N **19 Claims**

1. A composition of matter selected from the group consisting of compounds of the formula:



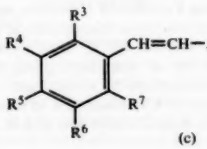
where

R_1 is selected from the group consisting of



(a) (b)

or



(c)

R^2 is hydroxy, lower alkoxy, amino, mono(lower alkyl)amino, or di(lower alkyl)amino; R^3 is lower alkyl or halogen, R^4 is lower alkyl; R^5 is lower alkoxy; R^6 is hydrogen or lower alkyl and R^7 is lower alkyl or halogen

and pharmaceutically acceptable salts thereof when R^2 is hydroxy.

4,539,155

NEW PEPTIDE, PROCESS FOR PREPARATION THEREOF AND USE THEREOF

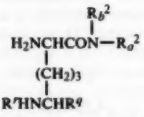
Yoshihiko Kitaura, Sakurai; Osamu Nakaguchi, Toyonaka; Keiji Hemmi; Matsuhiko Aratani, both of Suita; Hidekazu Takeno, Tenri; Satoshi Okada; Hirokazu Tanaka, both of Takatsuki; Masashi Hashimoto, Takarazuka; Yoshio Kuroda, Takatsuki; Eiko Iguchi, Osaka; Masanobu Kohsaka, Sakai; Hatsuo Aoki, Ikeda, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Division of Ser. No. 377,841, May 13, 1982, which is a division of Ser. No. 229,072, Jan. 28, 1981, Pat. No. 4,349,466, which is a continuation-in-part of Ser. No. 201,241, Oct. 27, 1980, Pat. No. 4,322,341, which is a continuation-in-part of Ser. No. 171,024, Jul. 22, 1980, abandoned, which is a continuation-in-part of Ser. No. 149,441, May 13, 1980, abandoned, which is a continuation-in-part of Ser. No. 147,710, May 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 110,020, Jan. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 093,523, Nov. 13, 1979, Pat. No. 4,311,640. This application Jul. 21, 1983, Ser. No. 515,590

Int. Cl.[3] C07C *103/52, 101/20, 69/74, 101/30*

U.S. Cl. 260—112.5 R **3 Claims**

1. A compound of the formula or its salt:



wherein

R_a^2 is mono- or di-carboxy (or protected carboxy)-lower alkyl or ar(carboxy or protected carboxy)-lower alkyl whose aryl moiety may be substituted by hydroxy,

R_b^2 is hydrogen or lower alkyl,

R^r is hydrogen or amino protective group, and

R^q is carboxy or protected carboxy, provided that when R_b^2 is hydrogen,

then R_a^2 is mono- or di-carboxy lower alkyl having 1 and 3 to 6 carbon atoms, $—CH_2CH_2COOH$ or ar(carboxy) lower alkyl whose aryl moiety may be substituted by hydroxy.

4,539,156

LIQUID DIPHENYLMETHANE DIISOCYANATE COMPOSITIONS

John E. Dewhurst, Oakdale; Jeffrey F. Dormish, Pittsburgh, both of Pa., and Richard S. Pantone, New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Dec. 14, 1984, Ser. No. 681,568

Int. Cl.[3] C07C *119/048*

U.S. Cl. 260—453 SP **11 Claims**

1. A process for the preparation of a stable, liquid adduct comprising reacting a mixture of 1,3-butane diol and propylene glycol with diphenylmethane diisocyanate at a temperature of from about 25° C. to about 120° C. in an amount such that the resultant product has an isocyanate group content of from about 20 to about 30 percent by weight, and wherein the ratio of mole equivalents of 1,3-butane diol to mole equivalents of propylene glycol is from 0.05:0.95 to 0.95:0.05, with the further proviso that

(i) if the 4,4'-isomer content of the diphenylmethane diisocyanate is equal to or greater than 90 percent by weight, then said ratio is from 0.45:0.55 to 0.70:0.30, and

(ii) if the 4,4'-isomer content of the diphenylmethane diisocyanate is less than 90 percent by weight, but not less than 70 percent by weight, then said ratio is from 0.30:0.70 to 0.85:0.15.

4,539,157

LIQUID DIPHENYLMETHANE DIISOCYANATE COMPOSITIONS

John E. Dewhurst, Oakdale; Jeffrey F. Dormish, Pittsburgh, both of Pa., and Richard S. Pantone, New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Dec. 14, 1984, Ser. No. 681,570

Int. Cl.[3] C07C *119/048*

U.S. Cl. 260—453 SP **11 Claims**

1. A process for the preparation of a stable, liquid adduct comprising reacting a mixture of neopentyl glycol and propylene glycol with a diphenylmethane diisocyanate containing less than 85 percent by weight of the 4,4'-isomer at a temperature of from about 25° C. to about 120° C. in an amount such that said adduct has an isocyanate group content of from about 20 to about 30 percent by weight and wherein the ratio of mole equivalents of neopentyl glycol to mole equivalents of propylene glycol is from 0.05:0.95 to 0.95:0.05, with the further proviso that

(i) if the 4,4'-isomer content of the diphenylmethane diisocyanate is not less than 80 percent by weight, then said ratio is from 0.45:0.55 to 0.70:0.30,

(ii) if the 4,4'-isomer content of the diphenylmethane diisocyanate is less than 80 percent by weight but not less than 70 percent by weight, then said ratio is from 0.35:0.65 to 0.85:0.15, and

(iii) if the 4,4'-isomer content of the diphenylmethane diisocyanate is less than 70 percent by weight, but not less than 65 percent by weight, then said ratio is from 0.15:0.85 to 0.95:0.05.

4,539,158

LIQUID DIPHENYLMETHANE DIISOCYANATE COMPOSITIONS

John E. Dewhurst, Oakdale; Jeffrey F. Dormish, Pittsburgh, both of Pa., and Richard S. Pantone, New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Dec. 14, 1984, Ser. No. 681,747

Int. Cl.[3] C07C *119/048*

U.S. Cl. 260—453 SP **11 Claims**

1. A process for the preparation of a stable, liquid adduct comprising reacting a mixture of 1,3-butane diol and neopentyl glycol with diphenylmethane diisocyanate at a temperature of from about 25° C. to about 120° C. in an amount such that said adduct has an isocyanate group content of from about 20 to about 30 percent by weight, and wherein the ratio of mole equivalents of 1,3-butane diol to mole equivalents of neopentyl glycol is from 0.05:0.95 to 0.95:0.05, with the further proviso that

(i) if the 4,4'-isomer content of the diphenylmethane diisocyanate is equal to or greater than 98 percent by weight, then said ratio is from 0.30:0.70 to 0.65:0.35,

(ii) if the 4,4'-isomer content of the diphenylmethane diisocyanate is less than 98 percent by weight but not less than 90 percent by weight, then said ratio is from 0.30:0.70 to 0.75:0.25,

(iii) if the 4,4'-isomer content of the diphenylmethane diisocyanate is less than 90 percent by weight but not less than 80 percent by weight, then said ratio is from 0.30:0.70 to 0.85:0.15, and

(iv) if the 4,4'-isomer content of the diphenylmethane diisocyanate is less than 80 percent by weight but not less than 65 percent by weight, then said ratio is from 0.30:0.70 to 0.05:0.05.

4,539,159

PROCESS FOR REACTION OF MERCAPTOPHENOLS WITH VINYL COMPOUNDS

Mark R. Johnson, Breckenridge, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 23, 1984, Ser. No. 603,040

Int. Cl.³ C07C *121/75, 149/40*

U.S. Cl. 260—465 F 7 Claims

1. An improved process for preparing derivatives of mercaptophenols containing nitrile, carbonyl, sulphone or ester groups by reacting a mercaptophenol with a vinyl compound containing a conjugated nitrile, carbonyl, sulphone or ester group said process characterized by reacting said mercaptophenol and said vinyl compound in a polar solvent with an amine catalyst.

4,539,160

KETENE O,O-ACETALS AND THEIR PREPARATION

Alfred Ruland, Hirschberg, and Wolfgang Reuther, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

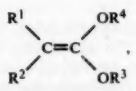
Filed Oct. 27, 1983, Ser. No. 545,877

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1982, 3240287

Int. Cl.³ C07C *43/313;* C07D *231/12, 235/04, 249/08*

U.S. Cl. 260—465 F 3 Claims

1. A ketene O,O-acetal of the formula I



I

where R^1 is a tertiary alkyl radical of 4 to 6 carbon atoms or halogen-substituted phenyl, R^2 is hydrogen and R^3 and R^4 independently of one another are each phenyl which is unsubstituted or substituted by halogen, alkoxy, alkyl, phenyl, phenoxy, cyano, nitro or trifluoromethyl.

4,539,161

AMINE OXIDE COMPOUNDS

Leonardo Guglielmetti, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

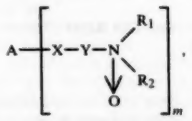
Filed Jul. 13, 1981, Ser. No. 282,559

Claims priority, application Switzerland, Jul. 25, 1980, 5708/80

Int. Cl.³ C07C *121/66, 135/02*

U.S. Cl. 260—465 E 6 Claims

1. An amine oxide compound of the formula



in which m is 1 or 2, A is a brightener radical selected from the group consisting of the 4,4'-distyrylbiphenyls, 4,4'-divinyl-stilbenes and 1,4-distyrylbenzenes, which are unsubstituted or substituted by 1–4 substituents selected from halogen, alkyl, hydroxyalkyl, halogenoalkyl, cyanoalkyl, alkoxyalkyl, phenylalkyl, carboxyalkyl, carbalkoxyalkyl, alkenyl, cycloalkyl, alkoxy, alkenyloxy, alkoxycarbonyl, carbamoyl, cyano, alkylsulfonyl, phenylsulfonyl, alkyloxysulfonyl, sulfamoyl, hydroxyl, carboxyl, sulfo and trifluoromethyl, X is a direct bond between A and Y, an oxygen atom or sulfur atom or a group of the formula $-SO_2-$, $-SO_2-O-$, $-COO-$, $-CON(R)-$ or $-SO_2N(R)-$, in which R is hydrogen, alkyl or alkyl substituted by halogen, cyano, hydroxyl, C_2–C_5-carbalkoxy, C_1–C_4-alkoxy, phenyl, chlorophenyl, methylphenyl, methoxyphenyl, carbamoyl or sulfamoyl, Y is alkylene or alkyleneoxyalkylene or either of said groups substituted by halogen, hydroxyl, C_2–C_5-carbalkoxy, C_1–C_4-alkoxy, phenyl, chlorophenyl, methylphenyl, methoxyphenyl, carbamoyl or sulfamoyl, and R_1 and R_2 independently of one another are cycloalkyl, alkyl or phenyl, or alkyl substituted by halogen, hydroxy, C_2–C_5-carbalkoxy, C_1–C_4-alkoxy, phenyl, chlorophenyl, methylphenyl, methoxyphenyl, carbamoyl or sulfamoyl, wherein in all said carbamoyl or sulfamoyl groups the nitrogen atom is unsubstituted or substituted by 1 or 2 groups chosen from C_1–C_4-alkyl, C_1–C_4-hydroxyalkyl, C_2–C_5-cyanoalkyl, C_1–C_4-halogenalkyl, benzyl or phenyl.

4,539,162

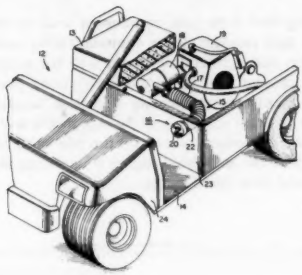
CHOKE ASSEMBLY FOR GOLF CART

James C. Ferrell, Martinez, Ga., assignor to Club Car, Inc., Augusta, Ga.

Filed May 10, 1984, Ser. No. 609,020

Int. Cl.³ F02M *1/02*

U.S. Cl. 261—1 11 Claims



1. An air inlet assembly for the carburetor for an internal combustion engine of a golf cart or the like, which increases engine life, reduces maintenance cost and eliminates the need for a choke cable and butterfly valve comprising in combination,

a passenger compartment protected from ground dust, and an engine compartment containing a carburetor,

an air inlet port for air for combustion located in the passenger compartment for providing clean air to the carburetor,

manual choking means in the passenger compartment for interrupting the flow of air through said inlet port, and

a tube means comprising the major air supply for said engine and connecting said air inlet to said carburetor.

4,539,163

CARBURETOR

Yoshihiro Sakurai, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Jun. 24, 1983, Ser. No. 507,509

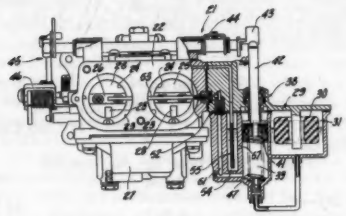
Claims priority, application Japan, Jul. 13, 1982, 57-120536; Jul. 13, 1982, 57-120537; Jul. 23, 1982, 57-127692

Int. Cl.³ F02M *7/08*

U.S. Cl. 261—34 A 5 Claims

1. In a charge forming device for an internal combustion engine or the like having a fuel source, an induction passage, a throttle valve for controlling the flow through said induction passage, and an idle circuit communicating said fuel source with a position in said induction passage contiguous to said throttle valve, a main fuel discharge circuit for discharging fuel from said fuel source into said induction passage upstream of said idle circuit and said throttle valve, an accelerating pump comprising an accelerating pump well in communication with said fuel source, a pumping element operably connected to said throttle valve and movable in said accelerating pump well in

response to movement of said throttle valve for pressurizing fuel contained therein and an accelerating pump discharge for discharging pressurized fuel into said induction passage, the improvement comprising enrichment means for delivering fuel from said fuel source to said induction passage substantially only when the associated engine is operating in an off idle to a predetermined slow speed range, said enrichment means comprising an enrichment well, an enrichment discharge circuit for



delivering fuel from said enrichment well to said induction passage, and passage means communicating said enrichment well with said accelerating pump well for supplying fuel to said enrichment well from said accelerating pump well, said passage means communicating with said accelerating pump well at a position wherein said passage means will be closed by said pumping element when said throttle valve is opened to a point where the associated engine is operating above the predetermined slow speed range.

4,539,164

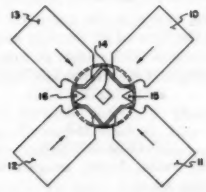
METHOD FOR FABRICATING A SUPPORT FOR A BUBBLE CAP ON THE END OF ITS RISER TUBE

Wayne L. Roberts, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 9, 1984, Ser. No. 598,128

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—114 A **1 Claim**



1. The method of forming a bubble cap assembly comprising a cylindrical riser tube supporting a bubble cap on its upper end, including,

moving four metal shearing and forming jaws in a horizontal plane toward the upper portion of the riser tube,

advancing the jaws simultaneously into the side of the riser tube to first horizontally shear a portion of the upper end of the riser tube and deforming the sheared sides of the tube inwardly until the sheared material of the riser tube wall extends over the central axis of the tube to form a spider with an aperture coinciding with the axis of the riser tube, and

extending a bolt through the aperture formed in the spider as a link between the bubble cap and riser tube.

4,539,165

METHOD FOR THE CASTING OF LARGE-SIZE OBJECTS OUT OF A HIGH-VISCOSITY CONCRETE MIX

Ilmari Paakkinen, Toijala, Finland, assignor to Oy Partek AB, Toijala, Finland

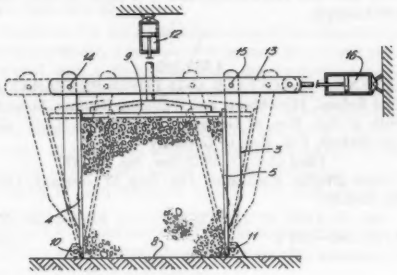
PCT No. PCT/FI82/00045, § 371 Date Jun. 10, 1983, § 102(e) Date Jun. 10, 1983, PCT Pub. No. WO83/01594, PCT Pub. Date May 11, 1983

PCT Filed Oct. 21, 1982, Ser. No. 506,547

Claims priority, application Finland, Nov. 10, 1981, 813555

Int. Cl.³ B28B *1/08, 3/00;* B30B *9/28*

U.S. Cl. 264—23 **3 Claims**



1. A method in the casting of large-size concrete objects or corresponding elements for compacting high-viscosity mix, wherein repeated parallel dislocations back and forth are provided in various regional zones of the mechanically pressurized high-viscosity casting mix present in the mould, and in particular in parallel dislocation planes of the casting mix, by pivoting two opposite mould wall portions in synchronization and always in the same direction in relation to each other, said pivoting provided by a plurality of shafts at a spaced distance from one another, said plurality of shafts positioned in planes defined by said mould walls, and parallel to each other and to the parallel dislocation planes of the casting mix.

4,539,166

PROCESS FOR THE PRODUCTION OF A LIGHTFAST AND COLORFAST COMPOSITE PLASTIC PART

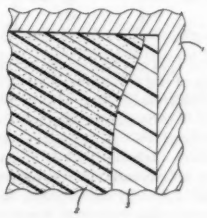
Adolf Richartz, Cologne; Wolfgang Reichmann, Hilden, and Ulrich Knipp, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,692

Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3219039

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—45.1 **11 Claims**



1. A process for the production of a lightfast and colorfast composite part of cellular plastics by the successive introduction of reaction mixtures into a closed mold with a rigid cavity, such that the first mixture is foamable and is introduced into

the cavity, then a second reaction mixture is introduced into the cavity, after the first mixture has at least become resistant to permeation, but is still compressible, such that the second reaction mixture surrounds the first mixture and compresses it, characterized in that

A. the first reaction mixture comprises aromatic isocyanates having isocyanate contents of from 5 to 50%, by weight: one or more compounds with molecular weights of from 32 to 10,000, which contain at least two isocyanate-reactive hydrogen atoms, such that the equivalent ratio of isocyanate to compounds containing isocyanate-reactive hydrogen atoms is from 0.8:1 to 5:1: and from 0.1 to 20%, by weight, (based on the reaction mixture), of a blowing agent comprising a compound which releases CO_2; and

B. the second reaction mixture comprises aliphatic, cycloaliphatic, or a combination of aliphatic and cycloaliphatic polyisocyanates having isocyanate contents of from 10 to 50%, by weight: one or more compounds with molecular weights of from 32 to 10,000, which contain at least two isocyanate-reactive hydrogen atoms, such that the equivalent ratio of isocyanates to compounds containing isocyanate-reactive hydrogen atoms is from 0.8:1 to 5:1; and an internal mold release agent selected from the group consisting of polysiloxane, hydroxypolysiloxanes or salts of polysiloxanes containing amino groups with long chain fatty acids.

4,539,167

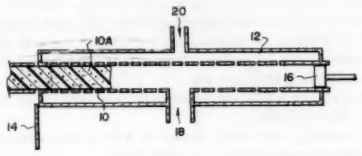
METHOD OF MOLDING AN ELONGATE FOAMED RESIN ARTICLE FROM EXPANDABLE THERMOPLASTIC RESIN BEADS

Wolfgang E. Schedel, 136 Terrace Rd., Sebenza, Edenvale, Johannesburg, Transvaal, South Africa

Filed Apr. 5, 1983, Ser. No. 482,161

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—51 **6 Claims**



1. A method of molding an elongate article from expandable thermoplastic resin beads, comprising the steps of:

(a) introducing the expandable thermoplastic resin beads into a mold defining a mold cavity having first end and an opposite second end;

(b) introducing steam into the mold cavity to expand and bond said beads in the mold cavity;

(c) starving the beads of steam in an end zone at the first end of the mold cavity so that said beads in said end zone are not fully expanded and not fully bonded to each other;

(d) allowing the beads in the mold cavity to partly expand and coalesce to form a partly formed article in the mold cavity;

(e) moving the partially formed article in a direction of the second end of the mold cavity with an end face of the article which carries the partially expanded beads forming a wall in the mold cavity at a contact zone of the mold cavity intermediate the first and second ends of the mold cavity;

(f) introducing fresh expandable thermoplastic resin beads into the mold cavity and into contact with the partially expanded beads in the contact zone of the mold cavity;

(g) again introducing steam into the mold cavity to fully expand and fully bond the partially expanded beads and the fresh beads in the contact zone as well as remaining fresh beads in the mold cavity with the exception of fresh beads in the end zone of the mold cavity adjacent the first end of the mold cavity which are starved of steam so that the fresh beads in the end zone of the mold cavity are only partially expanded and partially bonded; and

(h) repeating steps (a) to (g) until the article has reached a desired length.

4,539,168

DEVICE AND PROCESS FOR MAKING THIN-WALLED WAX MODELS FOR LOST-WAX CASTING

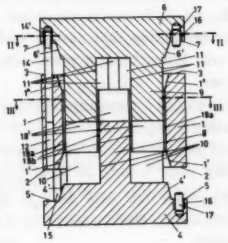
Manfred Brugger, Birmenstorf, and Peter Vogt, Mellingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 22, 1982, Ser. No. 421,100

Claims priority, application Switzerland, Oct. 1, 1981, 6326/81

Int. Cl.³ B29C *1/02*

U.S. Cl. 264—102 **6 Claims**



1. A process for making thin walled wax models for lost wax casting in a device comprising:

a casing having an axis and upper and lower axial faces;

a lower closing plate having an axial face movable into contact with said lower axial face of said casing, said lower closing plate including lower core means movable into said casing;

an upper closing plate having an axial face movable into contact with said upper axial face of said casing, said upper closing plate including upper core means movable into said casing; wherein said lower core means comprise an array of lower core members, each of said lower core members being immovably fixed to said lower closing plate and extending to said upper closing plate when said contacting faces are in contact with one another, each of said lower core members having a tapered diminution from said lower closing plate to the end thereof of 40 minutes of arc or less, wherein said upper core means comprise an array of upper core members, each of said upper core members being immovably fixed to said upper closing plate and extending to said lower closing plate when said contacting faces are in contact with one another, each of said upper core members having a tapered diminution from said upper closing plate to the end thereof of 40 minutes of arc or less, and wherein said upper and lower core members are in mutually alternating positions and define therebetween, together with said casing, continuous channels into which wax may be introduced;

first biasing means in one of said axial face of said upper closing plate and said upper axial face of said casing, said first biasing means biasing the other of said axial face of said upper closing plate and said upper axial face of said casing; and

second biasing means in one of said axial face of said lower closing plate and said lower axial face of said casing, said second biasing means biasing the other of said axial face of said lower closing plate and said lower axial face of said casing;

said process comprising the steps of:

applying closing pressure to close said device so that said axial faces of said casing are in contact with respective axial faces of said upper and lower closing plates, so that said upper and lower core means are positioned in said casing and so that said first and second biasing means are tensioned;

evacuating air from free spaces between said upper and lower core means and among said core means and said casing;

introducing liquid wax into said free spaces;

permitting said wax to solidify into said wax model;

abruptly releasing said closing pressure, whereby said axial faces of said casing and said respective axial faces of said upper and lower closing plates are abruptly and simultaneously axially separated by said first and second biasing means and said wax model is separated from said core means; and

axially fruther separating said casing, said upper closing plate and said lower closing plate, whereby said wax model is freed.

2. A multi-part device for making thin walled wax models for lost wax casting, comprising:

a casing having an axis and upper and lower axial faces;

a lower closing plate having an axial face movable into contact with said lower axial face of said casing, said lower closing plate including lower core means movable into said casing;

an upper closing plate having an axial face movable into contact with said upper axial face of said casing, said upper closing plate including upper core means movable into said casing; wherein said lower core means further comprise an array of lower core members, each of said lower core members being immovably fixed to said lower closing plate and extending to said upper closing plate when said contacting faces are in contact with one another, each of said lower core members having a tapered diminution from said lower closing plate to the end thereof of 40 minutes of arc or less, wherein said upper core means further comprise an array of upper core members, each of said upper core members being immovably fixed to said upper closing plate and extending to said lower closing plate when said contacting faces are in contact with one another, each of said upper core members having a tapered diminution from said upper closing plate to the end thereof of 40 minutes of arc or less, and wherein said upper and lower core members are in mutually alternating positions and define therebetween, together with said casing, continuous channels into which wax may be introduced;

first biasing means in one of said axial face of said upper closing plate and said upper axial face of said casing, said first biasing means biasing the other of said axial face of said upper closing plate and said upper axial face of said casing; and

second biasing means in one of said axial face of said lower closing plate and said lower axial face of said casing, said second biasing means biasing the other of said axial face of said lower closing plate and said lower axial face of said casing;

wherein said first and second biasing means further comprise means for simultaneously and abruptly separating said upper and lower closing plates from said casing.

4,539,169

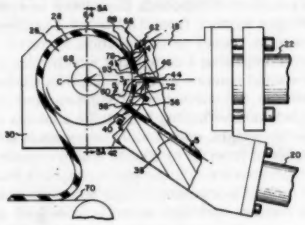
APPARATUS AND METHOD FOR FORMING A CO-EXTRUSION FROM EXTRUDED STRIPS

Bryan E. Nixon, Akron; Donald W. Ward, Silver Lake, and Ronald J. Zaucha, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 29, 1983, Ser. No. 518,736

Int. Cl.³ B29D *7/10*

U.S. Cl. 264—171 **30 Claims**



1. A multiple orifice roller die extrusion apparatus for combining two or more extrudable strips of elastomeric materials into a formed co-extrusion, said apparatus having a roller with an axis circumvented by a roller surface and means for rotating said roller about said axis comprising die head means positioned adjacent to and having a generally cylindrical surface conforming to said roller surface, a first orifice and a second orifice in said die head means at spaced-apart positions, said first orifice being located for applying at least a first strip of elastomeric material over said roller surface, said second orifice being located for applying at least a second strip of elastomeric material over said roller surface at said spaced-apart positions to form a single co-extrusion of the two strips and guide means extending over said roller surface for at least part of the distance between said spaced-apart positions so that said first strip is maintained in a predetermined axial location.

24. A method of forming a co-extrusion formed of at least two component strips on at least one roller surface of a roller die comprising the steps of

(a) applying a first extruded strip over said roller surface at a first position;

(b) rotating said roller about an axis to accommodate said first extruded strip over said roller;

(c) guiding said first extruded strip while it is carried by said roller at least part of the distance from said first position to a second position spaced apart from said first position;

(d) applying a second extruded strip over said roller surface at said second position to form a single co-extrusion of said two component strips on said roller.

4,539,170

PROCESS FOR STEAM-CONDITIONING SPIN-ORIENTED POLYAMIDE FILAMENTS

James W. Hare, Martinsville, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

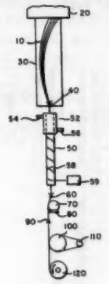
Filed Sep. 26, 1983, Ser. No. 535,689

Int. Cl.³ D01D *5/12*

U.S. Cl. 264—176 F **6 Claims**

1. An improved high speed spinning process for making partially-oriented polyamide draw texturing feed yarns with predetermined standards including the steps of extruding molten filaments of a synthetic fiber-forming polyamide from a spinneret assembly, cooling the molten filaments to a nontacky state in a quench chimney, conditioning the cooled filaments with steam by passage through a substantially vertical conditioning tube having heated upper and lower portions, introducing steam into the tube within its heated upper wall portion, and winding up the conditioned filaments under tension into a yarn package at a speed of from 3000 to 4000 ypm and wherein the improvement comprises regulating the tem-

perature of the lower heated wall portion independently of the upper portion as required to maintain a yarn property that varies with changes in the lower heated wall portion, within



predetermined limits while maintaining steam flow in the tube substantially constant whereby the acid dyeability of the yarn remains substantially unchanged.

4,539,171

DISPLACED SNORKEL SANDWICH MOLDING

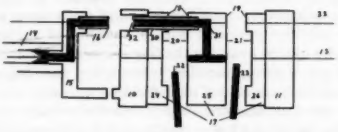
Jens O. Sorensen, Rancho Santa Fe, Calif., assignor to Primtec, Rancho Santa Fe, Calif.

Continuation-in-part of Ser. No. 398,606, Jul. 15, 1982. This application Oct. 25, 1982, Ser. No. 436,643

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.³ B28B *1/24*

U.S. Cl. 264—328.8 **15 Claims**



1. A method of injection molding a thermoplastic material by employing an injection molding machine with a clamping unit comprising some clamping platens which have a horizontal central axis, the clamping unit is used for opening and shutting some parting surfaces of a sandwich mold in a direction along the central axis of the clamping platens, located between two parting surfaces is a moveable middle mold part;

the sandwich mold comprises at least two cooling cavities each of which is encompassed by a different parting surface, so that each parting surface encompasses at least one cooling cavity;

the sandwich mold also comprises at least one fluid runner system, at least a part of which is located in said moveable middle mold part, each runner system comprises a runner orifice, and feeds at least one cooling cavity, each runner system feeds at most such cooling cavities as are encompassed by two parting surfaces;

the injection unit comprises one distinct nozzle for communication with each runner orifice, so that each cooling cavity has associated therewith a parting surface, a runner system, a runner orifice and a nozzle, the method relating to each specific cooling cavity comprising the steps of:

(a) shutting the associated parting surface by horizontal relative movement of the clamping plattens;

(b) sealing the associated nozzle with the associated runner orifice;

(c) injecting some hot molten thermoplastic material from the associated nozzle, via the associated runner system to fill the specific cooling cavity;

(d) cooling the injected plastic in the specific cooling cavity to thereby create a molded product;

(e) opening the associated parting surface by horizontal relative movement of the clamping platens in order to eject the molded product;

characterized by the sandwich mold comprising a snorkel which encompasses at least a part of one of said runner systems and its associated runner orifice, so that at least a part of the runner system is located in said moveable middlemold part, and so that the snorkel is attached to the moveable middle mold part, the snorkel projects with its associated orifice towards its associated nozzle and has a central axis, which is substantially parallel to, and displaced from, the central axis of the clamping plattens; and step (b) further comprising the step of:

(f) sealing the nozzle, which is located outside of the space which is encompassed between the extended geometric planes of the parting surfaces, with the runner orifices, by horizontal relative movement of the snorkel and the nozzle.

4,539,172

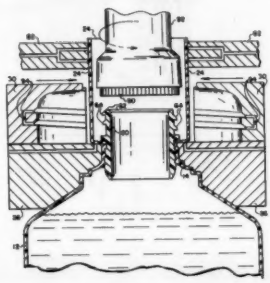
METHOD OF BLOWMOLDING A CONTAINER HAVING AN INTEGRAL INNER DISPENSING OUTLET

David A. Winchell, Spring Grove, and Thomas A. Fowles, McHenry, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 16, 1983, Ser. No. 562,247

Int. Cl.³ B29C *17/07*; B29D *3/00*

U.S. Cl. 264—515 **1 Claim**



1. A method of making a hermetically sealed container having a body, a neck, an outer closure and an inner dispensing outlet defined by a hollow tubular member, the steps comprising:

extruding a tubular, plastic parison;

positioning the pairson within a container-defining mold;

securing the outlet-defining tubular member upon a fluid supply mandrel, the fluid supply mandrel including a nozzle having a channel therethrough defined by an interior wall and an open end defining a mouth to the channel, an annular skirt depending from and extending about the nozzle, the annular skirt being spaced from the nozzle by an annular groove, the annular groove including a base, the mandrel further including a relatively sharp rim projecting from a distal end of the annular skirt and a plurality of projections disposed about the nozzle, the nozzle extending beyond the distal end of the annular skirt, such that the hollow, outlet-defining tubular member is mounted in the annular groove, between the projections about the nozzle and the annular skirt;

advancing the mouth of the supply mandrel with the tubular member thereabout toward the pairson, simultaneously both urging the tubular member into hermetic-seal rela-

tionship with the container neck, thereby securing the tubular member to the container neck and also forming a frangible line of weakness between the outer closure and the neck, the frangible line of weakness being formed by the relatively sharp rim of the mandrel;

subsequent to said mandrel advancement step, blowmolding the container body by injecting fluid through both the supply mandrel and the tubular member;

filling the container with the contents to be stored therein, through both the supply mandrel and the tubular member;

withdrawing the supply mandrel, leaving the tubular member permanently secured in the container neck portion;

subsequent to said mandrel withdrawal step, attaching a cap to the dispensing outlet; and

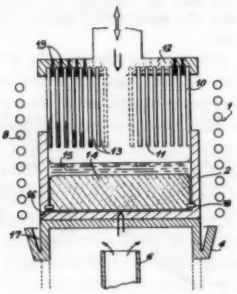
subsequent to said cap attachment step, forming the outer closure about the dispensing outlet so that the outer closure encloses the dispensing outlet.

4,539,173

PROCESS FOR PREPARING PLATES OF A METALLIC OR SEMIMETALLIC MATERIAL FROM A LIQUID MASS

Claude Potard, and Pierre Dusserre, both of Saint Egreve, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 17, 1983, Ser. No. 476,352
Int. Cl.³ B22D *27/04*
U.S. Cl. 264—570 **4 Claims**



1. A process for the preparation of plates of a first metallic or semimetallic material from a liquid mass of said material contained in a production device comprising on the one hand a crucible which also contains a second material, which is chemically inert with respect to the first, and on the other hand a shaping means, the second material having a density which is at the most equal to that of the first material and is immiscible therewith, whilst having a melting point well below that of the first material and a wetting power which is higher than that of the first material with respect to the production device, wherein the process comprises the following stages:

said shaping means having a group of parallel, equidistant, refractory plates, having walls, is lowered into the crucible until the lower end of the plates comes into contact with the second material wetting said walls:

the first material is made to penetrate spaces between the plates and is separated from the walls by a liquid film of the second material;

planned cooling takes place until the material to be produced solidifies, the second material remaining in liquid form;

the plates are removed;

the second material in excess is discharged;

cooling takes place to ambient temperature;

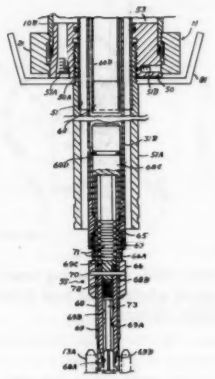
and the film of the second material which could still adhere to the first is removed.

4,539,174

FUEL PIN TRANSFER TOOL

Richard S. Patenaude, Old Saybrook, Conn., assignor to Maine Yankee Atomic Power Company, Augusta, Me.

Filed Sep. 29, 1982, Ser. No. 427,621
Int. Cl.³ G21C *19/10*
U.S. Cl. 376—261 **16 Claims**



1. A fuel pin transfer tool for use in withdrawing a fuel pin from or placing a fuel pin in a fuel pin assembly submerged in water in a tank, said tool including a tubular housing of such length that it may be suspended by means located above the water with a portion of the housing extending downwardly in the water in vertical alignment with and spaced a predetermined distance above a selected one of the fuel pins of the assembly or the location therein for a fuel pin, a first rigid axially movable means within the housing, an axial latching device connected to the lower end of said means including a collet member provided with a plurality of resilient fingers normally spaced apart for the free reception of the head end of a fuel pin, a sleeve member surrounding said fingers, one of said members connected to said axially movable means and the other member movable axially relative to said one member between upper and lower positions, said fingers and said sleeve member including surfaces that are mutually engageable and shaped to cam said fingers into a relationship for gripping the received end of a fuel pin when said axially movable member is in one of said positions, said fingers in their pin-receiving relationship when said axially movable member is in the other of said positions, axially located, resiliently compressible means having upper and lower ends, backing means above said fingers connected to said axially movable means and backing said lower end, said other member connected to said backing means in a manner establishing the upper and lower positions thereof, a connection between the upper end of said resilient means and said other member, said other member in the upper position thereof holding said resilient means under compression against downward movement unless a predetermined downward force is exerted against the connection capable of overcoming the resistance of said resilient means and to move said other member into the lower position thereof whereby said resilient means normally prevent axial movement of said other member, first operator controlled means operable to reciprocate said first axially movable means between upper and lower positions spaced apart a distance such that a stroke is provided of a length such that said latching device may be advanced into a position below the lower end of the housing in which a fuel pin is either to be released in or withdrawn from the assembly and a withdrawn pin at least partly received within the housing, second rigid axially movable means above said connection and a second operator control operable to drive said second axially movable means downwardly into such engagement with said connection as to exert said prede-

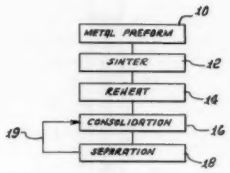
termined downward force thus to so move said other member as to enable said fingers to return to their normal relationship.

4,539,175

METHOD OF OBJECT CONSOLIDATION EMPLOYING GRAPHITE PARTICULATE

Wayne P. Lichti, Lakewood, and Alfred F. Hofstatter, Dana Point, both of Calif., assignors to Metal Alloys Inc., Irvine, Calif.

Filed Sep. 26, 1983, Ser. No. 535,791
Int. Cl.³ C22C 1/04
U.S. Cl. 419—49 **17 Claims**



1. The method of consolidating a metallic, metallic and ceramic, or ceramic body in any of initially powdered, sintered, fibrous, sponge, or other form capable of compaction, that includes the steps:

(a) providing a bed of flowable particles within a contained zone, said particulate primarily consisting of flowable and resiliently compressible carbonaceous particles in the form of beads having outwardly projecting nodules thereon, and at least some beads having surface fissures,

(b) positioning said body in said bed, to be surrounded by said beads,

(c) and effecting pressurization of said bed to cause pressure transmission via said particles to said body, thereby to compact the body into desired shape, increasing its density.

4,539,176

LOW GOLD DENTAL ALLOYS

Paul J. Cascone, Westchester County, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 4, 1984, Ser. No. 607,093
Int. Cl.³ C22C 5/04
U.S. Cl. 420—463 **22 Claims**

1. A low gold dental alloy consisting essentially of, by weight, about 10–40% gold; about 3–8% gallium; about 0.5–10% of at least one element selected from the group consisting of indium and tin; and about 0.1–1.5% of an element selected from the group consisting of ruthenium, iridium, and rhenium; balance palladium.

4,539,177

DENTAL ALLOYS FOR PORCELAIN-FUSED-TO-METAL RESTORATIONS

Arun Prasad, Cheshire, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

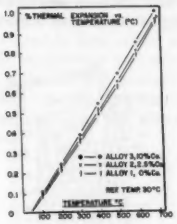
Division of Ser. No. 528,227, Aug. 31, 1983, and a continuation-in-part of Ser. No. 400,481, Jul. 21, 1982, Pat. No. 4,419,325. This application Jan. 25, 1984, Ser. No. 573,571
Int. Cl.³ C22C 5/04
U.S. Cl. 420—463 **8 Claims**

1. A method for reducing bubble formation during the firing of porcelain onto cast grain-refined palladium based dental alloys comprising:

(a) initially forming a grain-refined palladium based molten alloy in a ceramic crucible in a protective environment;

(b) admixing at least one oxide-forming element with said molten alloy to protect the alloy from absorbing gases during initial formation of the alloy, torch melting and casting, and the procelain firing process; and

(c) admixing zinc with said molten alloy in an amount sufficient to serve as a scavenger during initial formation of the



alloy, torch melting and casting, and the porcelain firing process; and

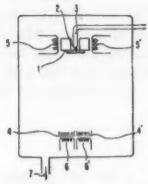
(d) pouring said molten alloy into a mold and allowing said alloy to solidify therein in said protective environment.

4,539,178

INDIUM-ANTIMONY COMPLEX CRYSTAL SEMICONDUCTOR AND PROCESS FOR PRODUCTION THEREOF

Keiji Kuboyama; Takeki Matsui, and Takeo Kimura, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 361,939, Mar. 25, 1982, Pat. No. 4,468,415. This application Jun. 14, 1984, Ser. No. 620,645
Int. Cl.³ B05D 5/12
U.S. Cl. 420—555 **4 Claims**



1. An indium-antimony complex crystalline semiconductor consisting essentially of crystals of an indium-antimony compound and crystals of indium alone, wherein the atomic ratio of the total indium content to the antimony content is in the range of from 1.1/1 to 1.7/1.

4,539,179

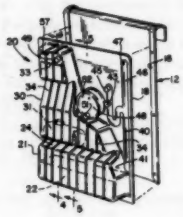
METHOD FOR CLEANSING AND DISINFECTING TOILET TANKS AND BOWLS

Gilbert K. Meloy, Earlville, Ill., assignor to Twinoak Products, Inc., Plano, Ill.

Division of Ser. No. 364,786, Apr. 2, 1982, Pat. No. 4,435,857. This application Dec. 27, 1983, Ser. No. 565,720
Int. Cl.³ E03D 9/02
U.S. Cl. 422—28 **13 Claims**

1. A method for cleansing and disinfecting a toilet tank and toilet bowl by treating the water discharged from the toilet tank each time the toilet is flushed, said method comprising the steps of providing a dispenser having means for hanging the dispenser in a toilet tank, a dispenser reservoir, a source of disinfectant soluble in water located in said reservoir, a volume control chamber communicating with said reservoir, a delivery tube vented to the atmosphere, a dispensing orifice defined by the delivery tube, and a passage defined between said delivery tube and said reservoir, placing said dispenser in said toilet tank in a position such that said orifice is located beneath the

normal level of water in the tank when the apparatus is placed in the tank, water being thereby introduced through said orifice, and said delivery tube being thereby placed in dynamic fluid communication with water in the toilet tank, the water then passing into said reservoir and into said volume control chamber and rising to the level of water in the tank, flushing



said toilet to achieve dropping of the water level in said tank below said dispensing orifice whereby the head of water in said volume control chamber forces a dose of aqueous disinfectant solution through said dispensing orifice and into said tank and maintaining the reservoir in fluid communication with the discharge orifice with no air-lock therebetween whereby disinfectant is dispensed even during extended quiescent periods.

4,539,180

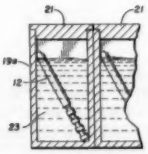
APPARATUS FOR QUANTITATIVELY DETERMINING THE LEVEL OF HEMOGLOBIN IN A BIOLOGICAL SAMPLE

Samuel Schwartz, St. Louis Park, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 190,399, Sep. 24, 1980, Pat. No. 4,378,971. This application Mar. 31, 1983, Ser. No. 480,857

Int. Cl.³ G01N *21/75, 33/52, 33/72*

U.S. Cl. 422—58 **2 Claims**



1. An apparatus for quantitatively determining the level of hemoglobin in a biological specimen comprising:

a device for preparing first and second test samples of a biological specimen including means defining first and second reaction chambers, said first reaction chamber containing a first reaction mixture comprising oxalic acid and ferrous oxalate for converting the heme portion of hemoglobin in a first test sample to porphyrin and said second reaction chamber containing a second reaction mixture comprising citric acid which is generally non-reactive with the heme portion of hemoglobin in a second test sample;

means for heating first and second test samples in respective first and second reaction chambers in the presence of the respective first and second reaction mixtures to a temperature and for a duration to convert the heme portion of hemoglobin in said first test sample to porphyrin; and

means for determining any fluorescence of porphyrin in said first and second test samples.

4,539,181

GAS MONITOR HAVING AN INDICATOR BAND AND A FORETUBE

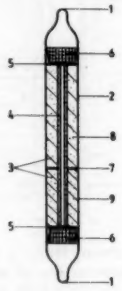
Bernhard Westrup, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 14, 1983, Ser. No. 542,212

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242304

Int. Cl.³ G01N *21/01, 31/22*

U.S. Cl. 422—59 **3 Claims**



1. A foretube for chemically converting a gas to be measured in a test gas which is adapted to flow through a monitor having an indicator band, comprising a glass tube having a breakaway tip at each end, a conversion-effecting filling in said glass tube and a capillary tube centrally arranged in said filling and defining a longitudinally extending open conduit which is parallel to said gas tube.

4,539,182

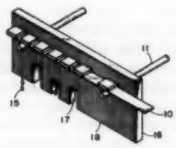
AUTOMATED REAGENT BLOTTER

Leighton C. Johnson, Edwardsburg, Mich., and James S. King, Jr., Goshen, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 8, 1983, Ser. No. 483,179

Int. Cl.³ G01N *35/00*

U.S. Cl. 422—99 **6 Claims**



1. Automated reagent blotter for removing excess fluid from a test device during the orientation of the test device, said automated reagent blotter consisting of:

blotter means comprising a single plate having a contact surface for contacting a dip-and-read test device and removing excess fluid from said dip-and-read test device while orientating the dip-and-read test device, in which the contact surface of the blotter means has a series of capillary grooves perpendicular to the plane of the test device which cause excess fluid to flow from the dip-and-read test device down the capillary grooves upon contact between the blotter means the dip-and-read test device and in which the length of the capillary grooves of said blotter means differ in order to vary the amount of fluid removed from different areasof the dip-and-read test device; and

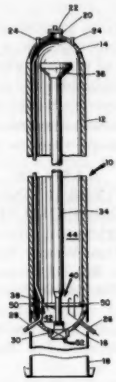
support means which support a dip-and-read test device and guide and support said blotter means as the blotter means contacts the dip-and-read device.

4,539,183

DISTRIBUTION GRID SUPPORT STRUCTURE

Malcolm W. Clark, Upper Montclair, and Harold B. Kohn, Cedar Grove, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed May 13, 1983, Ser. No. 494,169
Int. Cl.³ B01J *8/44, 8/24*
U.S. Cl. 422—143 **8 Claims**



1. In a reaction vessel having an interior surface and a distribution grid separating the vessel into a lower plenum chamber and an upper reaction zone, wherein the improvement comprises a support structure for said distribution grid comprising an inwardly-extending annular ring portion integrally formed with said reaction vessel, and a disc-shaped ring member attached to said annular ring portion, wherein said disc-shaped ring member and said interior surface of said reaction vessel including said annular ring portion have a layer of a metallic material coated thereon.

4,539,184

SCRUBBER FOR THE DESULFURIZATION OF EXHAUST GASES

Werner Stehning, Dorsten, Fed. Rep. of Germany, assignor to Gottfried Bischoff Bau Kompl. Gasreinigunga- und Wasserruckkuhlanlagen GmbH, Essen, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 493,984
Claims priority, application Fed. Rep. of Germany, May 15, 1982, 3218470
Int. Cl.³ B01J *10/00, 12/00*
U.S. Cl. 422—170 **12 Claims**

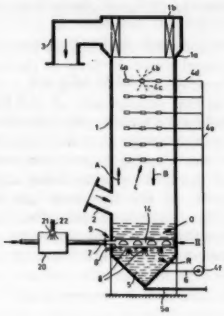
1. A scrubber for removing sulfur compounds from a gas, comprising:

a vertically extending column having a lower portion and an upper portion, inlet means connected and communicating with said lower portion for feeding sulfur bearing gases to said column, said sulfur bearing gases passing into said upper portion, outlet means connected to and communicating with said upper portion for discharging the scrubbed gas;

means in said upper portion of said column for contacting said sulfur bearing gases with a scrubbing liquid containing a sulfur-binding substance whereby a scrubbing liquid containing sulfur compounds descends in said column through said lower portion;

means forming a sump in said lower portion of said column for collecting the scrubbing liquid, said sump being provided with an outlet for a sump product consisting primarily of calcium sulfate;

a grate formed by a multiplicity of mutually parallel closely spaced oxygen-inlet ducts formed in said sump and subdividing said sump into an oxidation zone above said grate wherein oxygen from said ducts reacts sulfite in the liquid in said oxidation zone to form sulfate and into a reaction zone below said grate where said sulfate is precipitated out as calcium sulfate in said product, said ducts being downwardly open upwardly convex hoods supplied via oxygen supply means and formed with upwardly directed



orifices for discharging oxygen into the liquid in said oxidation zone, the spacing between said hoods being sufficiently limited to prevent backflow from said reaction zone to said oxidation zone, said inlet for said gas being located below said means for contacting but above said sump, said outlet for said gas being located above said means for contacting; and

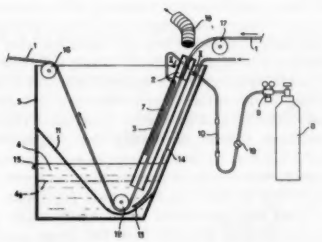
means for introducing an additive into said reaction zone below said grate for inducing the precipitation of the sulfate from said liquid as the calcium sulfate of said product.

4,539,185

REACTOR FOR THE FIXATION OF A GAS ON A SOLID WHICH MAY BE USED IN PARTICULAR FOR CHLORINATION OF WINDSCREEN WIPER BLADES

Guy L. Muller, Sevres; Daniel F. Fraioli, Bois Colombes, and Michel B. Oulie, Issy-Les-Moulineaux, all of France, assignors to Equipements Automobiles Marchal, Issy-les-Moulineaux, France

Filed Dec. 2, 1983, Ser. No. 557,435
Claims priority, application France, Dec. 6, 1982, 82 20405
Int. Cl.³ B01J *1/00*
U.S. Cl. 422—233 **9 Claims**



1. Apparatus for the fixation of a treatment gas in its vapor state, on a length of solid which fixes the said gas spontaneously, said apparatus comprising:

a reactor vessel having a sealed side wall, an inlet opening of a predetermined cross-section and length, and an outlet opening at a lower end of the vessel;

means for maintaining said outlet opening of said vessel submerged in a liquid inert to the treatment gas so as to constitute a liquid seal;

means for feeding a length of the solid to be treated into said vessel through said inlet opening and for moving said solid within the vessel from the inlet opening to said outlet opening;

said solid having a cross-section slightly smaller than the cross-section of the inlet opening so that there is an annular clearance space of a predetermined cross-section and length between the solid and the interior of the inlet opening;

means for feeding the treatment gas into the lower end of the reactor vessel above the level of the liquid seal; and

means for controlling the feeding of the treatment gas to the reactor so that substantially all the treatment gas fed is fixed on the solid moving through the reactor vessel;

said cross-section of the clearance space between the solid and the inlet opening being sufficiently small, and the length of the inlet opening being sufficiently long that substantially all the treatment gas tending to escape through the clearance space is fixed on the solid as the solid is fed through the inlet opening, whereby escape of the treatment gas through the inlet is substanially prevented.

4,539,186

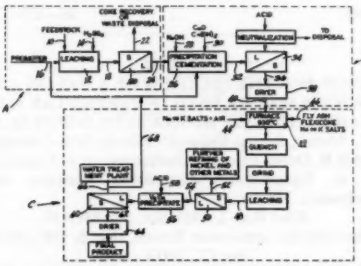
METHOD FOR LEACHING AND RECOVERING VANADIUM FROM VANADIUM BEARING BY-PRODUCT MATERIALS

Roberto Schemel; Domingo Rodriguez, and Ramon Salazar, all of Caracas, Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Mar. 15, 1984, Ser. No. 589,951

Int. Cl.³ C01G *31/00, 53/04*

U.S. Cl. 423—62 **28 Claims**



1. A process for the removal and recovery of vanadium and nickel from vanadium-nickel bearing materials comprising the steps of providing a vanadium-nickel bearing feedstock; leaching said vanadium-nickel bearing feedstock with an acid solution having a leaching promoter in said acid solution wherein said leaching promoter is a material selected from the group consisting of an ionic form of vanadium, hypochlorites of sodium, calcium and potassium, peroxides, chlorine dioxide and mixtures thereof; separating the pregnant leach liquor from the leached feedstock material and adjusting said pregnant leach liquor with a precipitating agent to a pH in the range of from about 5.5 to 6.5 so as to precipitate vanadium in its trivalent and tetravalent states wherein said precipitating agent is a material selected from the group consisting of hydroxides of sodium, potassium, calcium and mixtures thereof; and further adjusting the pregnant leach liquor with said precipitating agent to a pH in the range of from about 8.5 to 9.5 so as to precipitate nickel oxide.

4,539,187

METHOD FOR SEPARATING AND RECOVERING SILICA, ALUMINUM AND IRON FROM FLY ASH, MINERAL ORES AND MINE TAILINGS

James J. Russ, Lawrenceburg, and John W. Smith, Germantown, both of Tenn., assignors to Hydro Fuels, Inc., Wilmington, Del.

Filed Oct. 21, 1983, Ser. No. 544,437

Int. Cl.³ C01F *7/00*; C01B *33/18*

U.S. Cl. 423—132 **12 Claims**

12. A method comprising reacting solids selected from the group consisting of fly ash, mineral ores and mine tailings, said solids comprising aluminum, iron and silicon with sufficient fluosilicic acid and hydrogen fluoride to form fluoride and silico fluorides of iron, aluminum and silicon; distilling said mixture to form vaporous, aqueous silicon fluoride, and separating said aqueous, vaporous silicon fluoride from the fluorides and fluosilicates of iron and aluminum; hydrolyzing the silicon fluorides to form highly pure silicon dioxide and hydrogen fluoride, and recovering highly pure silicon dioxide substantially free of aluminum, iron and other impurities.

4,539,188

PROCESS OF AFTERBURNING AND PURIFYING PROCESS EXHAUST GASES

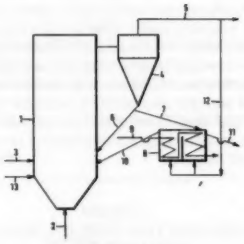
Martin Hirsch, Friedrichsdorf; Wolfram Schnabel, Idstein; Harald Sauer, and Hans-Werner Schmidt, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,913

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307848

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—210 **9 Claims**



1. A process for afterburning and purification of process exhaust gases which contain combustible constituents consisting mainly of CO, H_2, hydrocarbons and of solid carbon (carbon black) and pollutants consisting mainly of sulfur compounds, comprising separately supplying the process exhaust gases and an oxygen-containing gas to a fluidized bed reactor of a circulating fluidized bed, wherein combustion and purification of the exhaust gases are effected at a temperature of 700° to 1100° C., at a gas velocity of 2 to 10 meters per second (empty pipe velocity) in the presence of solids, said solids containing a gas-purifying agent consisting of lime, limestone and/or dolomite having a particle size d_p 50 of 30 to 200 μm, and at solids/gas suspension conditions having an adjusted mean suspension density of 0.1 to 10 kg/m³, adjusting the stoichiometric ratio of gas-purifying agent to pollutant contained in the exhaust gas from the process or formed by the combustion to 1.2 to 3.0 (calculated as Ca:S) and recycling the solids entrained by the gases from the fluidized-bed reactor to the fluidized bed reactor in such a manner that the quantity of solids circulated per hour in the circulating fluidized bed is at least 5 times the weight of solids contained in the fluidized bed reactor.

4,539,189
METHOD FOR REMOVING SULFIDES FROM INDUSTRIAL GAS

Robert Starkston, San Rafael; Mark C. Luce, Vallejo, and Robert V. Homsy, Orinda, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 23, 1984, Ser. No. 573,242

Int. Cl.³ C01B *17/16, 31/20;* C01C *3/00*

U.S. Cl. 423—220 **11 Claims**

1. A process for removing a sulfide from a moist or dry gas stream containing a sulfide which comprises contacting the gas stream with a sorbent solution for a time sufficient to sorb a desired quantity of the sulfide from the gas stream, the sorbent solution containing at least 0.1 weight percent, based on the solvent, of an aromatic nitrile containing an electron-attracting substituent on the aromatic ring, said substituent having an attraction for electrons which is at least as strong as that of a halogen substituent, said solution further containing an effective catalytic amount of an organic tertiary amine, a mixture of organic tertiary amines, or a hydrosulfide derivative thereof, the amount of said tertiary amine present being at least 0.01 gram mol per gram equivalent of the nitrile, the solvent of said sorbent solution being an inert liquid solvent; separating the resulting sulfide-enriched solution from the resulting sulfide-reduced gaseous mixture; heating the sulfide-enriched solution to regeneration temperature; and recovering separately regenerated sorbent solution and sulfide product.

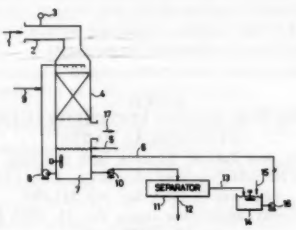
4,539,190
METHOD FOR THE TREATMENT OF EXHAUST GASES

Naoharu Shinoda; Atsushi Tatani; Kenji Inoue, and Susumu Okino, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1984, Ser. No. 649,482

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—240 **2 Claims**



1. A method for the wet treatment of a combustion exhaust gas comprising SO_2 and HCl, the method comprising detecting an amount of HCl in the exhaust gas, and feeding, to a circulating slurry in an exhaust gas treating tower, (a) a sodium salt in an amount corresponding to at least the detected amount of HCl so that all the HCl is able to be converted into NaCl in the exhaust gas treating tower and (b) $CaCO_3$ or $Ca(OH)_2$ serving as an absorbent for SO_2.

4,539,191
PREPARATION OF SODIUM SILICATE SOLUTIONS

John A. Kostinko, Bel Air, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 203,927, Nov. 4, 1980, Pat. No. 4,416,805, which is a division of Ser. No. 88,243, Oct. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 971,584, Dec. 20, 1978, Pat. No. 4,235,856. This application Nov. 7, 1983, Ser. No. 516,214

Int. Cl.³ C01B *33/28, 33/32*

U.S. Cl. 423—275 **6 Claims**

1. A method for the preparation of a sodium silicate solution which comprises dissolving sand in a sodium hydroxide solution at a pressure of at least 100 psig and a temperature of at least 130 degrees Celsius to produce a sodium silicate solution having a silica to sodium oxide molar ratio of between 2.4:1 and 2.8:1, and activating said sodium silicate solution by reaction with from about 50 to 2000 ppm of alumina.

4,539,192
PROCESS FOR REMOVING FLUORINE AND ORGANIC COMPOUNDS FROM PREPURIFIED WET PROCESSED PHOSPHORIC ACID

Günther Schimmel, Erftstadt; Reinhard Gradl, Hürth, and Gero Heymer, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,456

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1983, 3325121

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—321 R **3 Claims**

1. A process for removing impurities consisting of fluorine and organic compounds from wet-processed phosphoric acid prepurified by an extraction process, the process comprising: removing the impurities jointly in a single processing stage by combining the steps of (a) introducing the phosphoric acid into the upper portion of a closed structural element, treating it therein with steam flowing countercurrently to the phosphoric acid, at a temperature of 120°–180° C. and under a pressure of more than 1 bar; and (b) collecting the acid so treated in the lower portion of the structural element and reacting it with hydrogen peroxide; removing fluorine-containing vaporous matter overhead; and removing purified phosphoric acid from the lower portion of the structural element.

4,539,193
SYNTHESIS OF CRYSTALLINE SILICATE ZSM-12

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 23, 1984, Ser. No. 612,944

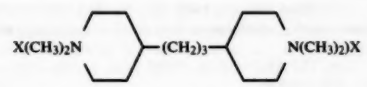
Int. Cl.³ C01B *33/28*

U.S. Cl. 423—328 **18 Claims**

1. A method for synthesizing a crystalline silicate having a composition in the anhydrous state, expressed in terms of mole ratios of oxides, as follows:

$$(0.1 \text{ to } 4)R_2O:(0.05 \text{ to } 2)M_{2/n}O:(0.005 \text{ to } 2)Al_2O_3:(100)SiO_2$$

wherein M is at least one alkali metal cation having the valence n, and R is a cation derived from the monomeric diquaternary bis(dimethylpiperidinium)trimethylene compound having the formula



wherein X is an anion, and exhibiting a characteristic X-ray diffraction pattern as shown in Table 1 of the specification, which comprises preparing a mixture containing sources of alkali metal oxide, an organic nitrogen-containing cation, an oxide of silicon and water and having a composition, in terms of mole ratios, within the following ranges:

SiO_2/Al_2O_3	60 or greater
H_2O/SiO_2	5 to 200
OH^-/SiO_2	0.01 to 2.0
M/SiO_2	0.01 to 3.0
R/SiO_2	0.02 to 1.5

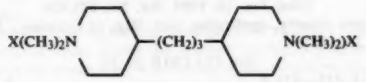
wherein M and R are as above defined, and maintaining the

mixture at a temperature of from about 80° C. to about 250° C. until crystals of the crystalline silicate are formed.

6. A synthetic crystalline silicate having a composition in the anhydrous state, expressed in terms of mole ratios of oxides, as follows:

$$(0.1 \text{ to } 4)R_2O:(0.05 \text{ to } 2)M_{2/n}O:(0.005 \text{ to } 2)Al_2O_3:(100)SiO_2$$

wherein M is at least one alkali metal cation having the valence n, and R is a cation derived from the monomeric diquaternary bis(dimethylpiperidinium)trimethylene compound having the formula



wherein X is an anion, and exhibiting a characteristic X-ray diffraction pattern as shown in Table 1 of the specification.

4,539,194

METHOD FOR PRODUCTION OF PURE SILICON

Gunnar Halvorsen, Vågsbygd, Norway, assignor to Elkem a/s, Oslo, Norway

Filed Feb. 6, 1984, Ser. No. 577,048
Claims priority, application Norway, Feb. 7, 1983, 830391
Int. Cl.³ C01B *33/02*
U.S. Cl. 423—348 **5 Claims**

1. A process for purifying metallurgical grade silicon which comprises the steps of adding one or more calcium compounds to molten metallurgical grade silicon in an amount sufficient to provide molten silicon containing about 1.0 to about 10.0% by weight of calcium, casting the molten silicon into molds and cooling the molten silicon at a sufficiently slow rate to obtain solid silicon having a grain size not over about 1.0 mm, precrushing the resulting silicon and leaching it in a first step with an aqueous solution of $FeCl_3$ or an aqueous solution containing $FeCl_3$ and HCL which cause disintegration of silicon, washing away fines from the leached silicon and in a second step leaching the silicon with an aqueous solution containing HF and HNO_3.

4,539,195

BASIC MAGNESIUM ALUMINUM HYDROXYCARBONATE

Klaus Schanz, Dannstadt-Schauernheim; Albert Schwind, Bad Dürkheim; Hartmut Grund, Waldsee, and Peter Klehr, Ludwigshafen am Rhein, all of Fed. Rep. of Germany, assignors to Giulini Chemie GmbH, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Feb. 23, 1984, Ser. No. 582,773
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306822
Int. Cl.³ A01N *59/06*; C01F *5/24, 11/18, 7/02*
U.S. Cl. 423—419 P **7 Claims**

1. Crystalline, basic aluminum magnesium carbonate of the formula

$$Al_2Mg_6(OH)_{12}(CO_3)_3.xH_2O$$

where x is at least 4.

3. Process for producing a basic aluminum magnesium carbonate of the formula

$$Al_2Mg_6(OH)_{12}(CO_3)_3.xH_2O$$

where x is at least 4

comprising: mixing together in an aqueous suspension active aluminum hydroxide, basic magnesium carbonate and at least one compound selected from magnesium hydroxide and active magnesium oxide, in stoichiometric quantities with respect to the aluminum and the magnesium, wherein the magnesium oxide provided by the basic magnesium carbonate is between 44 and 70 weight percent of the total magnesium oxide, converting the active aluminum hydroxide, basic magnesium carbonate and the compound or compounds selected from magnesium hydroxide and active magnesium oxide to the basic aluminum magnesium carbonate at temperatures from 50° to 100° C. under the influence of shearing forces, and directly recovering the resulting product having the formula $Al_2Mg_6(OH)_{12}.(CO_3)_3.xH_2O$ from the suspension by spray drying.

4,539,196

PROCESS FOR HYDROGENATING AN ALKYLATED ANTHRAQUINONE

Dalbir S. Sethi, Cranbury; Morton Meadow, Trenton, both of N.J., and Elizabeth A. Scarito nee Bagnall, Severna Park, Md., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 19, 1984, Ser. No. 601,823
Int. Cl.³ C01B *15/02*
U.S. Cl. 423—588 **20 Claims**

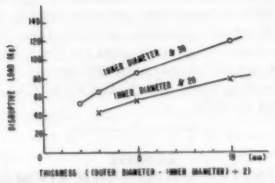
1. In a process for producing hydrogen peroxide by the cyclic steps of reducing, oxidizing, and extracting a working solution containing as a working compound an alkylated anthraquinone and the corresponding hydroquinone, tetrahydroanthraquinone and tetrahydroanthrahydroquinone, the improvement which comprises increasing the mol ratio of the nuclearly-hydrogenated, tetrahydro components of the working compound in the working solution by adjusting the concentration of the non-nuclearly hydrogenated working compounds to be equal to, or less than, the maximum solubility of the alkylated anthrahydroquinone formed in the working solution at the hydrogenation temperature, hydrogenating the working solution in the presence of a palladium catalyst at a pressure of 50 to 400 kilopascals at a temperature of 50° C. or less and recycling at least 90 percent of the hydrogenated working solution to the hydrogenator without oxidation and extraction thereby increasing the mol ratio of the tetrahydro components of the working compound without forming substantial quantities of undesirable by-products.

4,539,197

PROCESS FOR MAKING SINTERED COMPOSITE MECHANICAL PARTS

Kazuo Asaka, and Takashi Koyama, both of Chiba, Japan, assignors to Hitachi Powdered Metals Co., Ltd., Chiba, Japan

Filed Jul. 7, 1983, Ser. No. 511,493
Claims priority, application Japan, Jul. 13, 1982, 57-121813
Int. Cl.³ B22F *3/00*
U.S. Cl. 419—6 **2 Claims**



1. In a process for making a sintered mechanical part with a complex profile by preparing separately an inner compact having a shaft and an outer compact having an opening by the compression of iron-based metal powders, and sintering both compacts in a state where the inner compact is fitted into the outer compact,

the improvement which comprises:

pressfitting the shaft of the inner compact into the opening of the outer compact with an interference fit to form said mechanical part without exceeding the rupture strength of

said outer compact, and wherein the percent of interference in relation to the inner diameter of the opening of the outer compact is not higher than the value (0.23T+1 D+1.38)/300 wherein D is the inner diameter of the opening in the outer compact in millimeters and T is the wall thickness of the outer compact in millimeters, and subsequently sintering said mechanical part.

4,539,198

SOLID PHARMACEUTICAL FORMULATIONS FOR SLOW, ZERO ORDER RELEASE VIA CONTROLLED SURFACE EROSION: EXPANDED RANGE

David R. Powell, and Vithal K. Patel, both of Baudette, Minn., assignors to Rowell Laboratories, Inc., Baudette, Minn.

Filed Jul. 7, 1983, Ser. No. 511,605
Int. Cl.³ A61K *9/22, 9/32, 9/36, 31/60*
U.S. Cl. 424—19 **12 Claims**

1. A solid, orally administrable pharmaceutical tablet composition having an enteric coating on its surface from which the active ingredient has a slow, zero order release rate attained without layers, beads or enteric materials and without relatively insoluble polymers, waxes or gums when administered orally, said tablet being compressed to a hardness of about 5–20 kg, and being either shaped as a sphere, or else having a ratio of tablet thickness to tablet diameter effective to permit tablet erosion and penetration control sufficient for controlled surface erosion thereof, comprising an essentially homogeneous, granulated mixture of:

(a) an effective amount in the range of about 10–90 wt. % of 5-aminosalicylic acid as a pharmacologically active compound having a water solubility (20° C.) of less than 1/500 to 1/1000 (w/w);

(b) about 1–40 wt. % of a surface controlling compound which is pharmaceutically acceptable in oral compositions and has a water solubility (20° C.) of about 1/1–1/40 (w/w);

(c) about 2–20 wt. % of an erosion controlling compound which is pharmaceutically acceptable in oral compositions and has a water solubility of about 1/1–1/10 (w/w);

(d) an amount in the range of about 0.05–1.0 wt. %, of a surface activator which is a disintegrating agent for pharmaceutical compositions at which amount the compound is ineffective as a disintegrating agent;

(e) about 0.1–2.0 wt. % of a surfactant which is pharmaceutically acceptable in oral compositions, and, as necessary for tablet manufacturing purposes;

(f) about 1–20 wt. % of a binder which is pharmaceutically acceptable in oral compositions; or

(g) about 0.5–5.0 wt. % of a die wall lubricant which is pharmaceutically acceptable in oral compositions;

the pharmacologically active ingredient thus having a slow, zero order release rate when administered orally, and the pharmacologically active compound not being a lithium compound, and not being penny shaped or pancake shaped wherein the ratio of thickness to diameter is too small for erosion and penetration control.

4,539,199

SUSTAINED RELEASE PHARMACEUTICAL COMPOSITIONS

Ernö Orbán; János Borvendég; László Nagy; Márta Sótinée Tolvay, and Erzsébet Bander, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Continuation-in-part of Ser. No. 224,961, Jan. 14, 1981, abandoned. This application Jun. 1, 1982, Ser. No. 384,084
Int. Cl.³ A01N *25/12;* **A61K** *31/78*
U.S. Cl. 424—22 **7 Claims**

1. A stable solid pharmaceutical product for the sustained release of a pharmaceutical compound, which is the reaction product of a water soluble salt of a pharmaceutically active compound containing a secondary or tertiary amino group and an alkali or ammonium salt of an acid-group-containing synthetic copolymer selected from the group consisting of 1:1 mole ratio methacrylic acid/methacrylic acid methyl ester, 1:1 mole ratio methacrylic acid/acrylic acid methyl ester and 1:1:1 mole ratio methacrylic acid/acrylic acid methyl ester/methacrylic acid methyl ester copolymers.

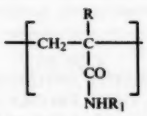
4,539,200

TREATMENT OF SKIN LESIONS

Alan Quarfoot, Palatine, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Nov. 4, 1983, Ser. No. 548,876
Int. Cl.³ A61K *31/78, 31/74*
U.S. Cl. 424—81 **5 Claims**

1. The method of cleansing, in patients in need of such cleansing, wounds and skin lesions or ulcers which comprises applying directly thereto in the absence of added organic liquid vehicle an effective amount of dry solid particles from 0.1 to 0.5 mm in diameter of a cross-linked water-insoluble polymer having the following polymer units



in which R is hydrogen, methyl or ethyl and R_1 is hydrogen, alkyl having 1 to 6 carbon atoms, or phenyl, said polymer being cross-linked with N,N′-methylene-bis-acrylamide or N,N′-diallyltartardiamide or N,N′-dihydroxyethylene-bis-acrylamide, the molar ratio of said polymer units to cross-linking agent being from 10:1 to 50:1, and

maintaining said particles in place to absorb serum or pus.

4,539,201

MEDICAMENT AND METHOD FOR INDUCING IMMUNITY TO INFECTIOUS BOVINE KERATOCONJUNCTIVITIS

Robert M. Gwin, 608 Stanton L. Young, Oklahoma City, Okla. 73104

Filed Oct. 28, 1983, Ser. No. 546,600
Int. Cl.³ A61K *39/095, 39/02;* **C12R** *1/36, 1/365*
U.S. Cl. 424—92 **11 Claims**

1. A medicament which induces immunity to infectious bovine Keratoconjunctivitis when administered to cattle comprising: an amount of gram-negative cocci selected form the group consisting of the genera Neisseria and Branhamella in combination with a pharmaceutically acceptable carrier wherein the amount introduced is effective to induce immunity to infectious bovine Keratoconjunctivitis when administered to said cattle.

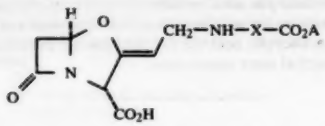
4,539,202

DERIVATIVES OF CLAVULANIC ACID, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Brian P. Clarke, Kingswood; John B. Harbridge, Coulsdon, and Irene Stirling, Reigate, all of England, assignors to Beecham Group p.l.c., England

Division of Ser. No. 176,161, Aug. 7, 1980, abandoned. This application Mar. 24, 1983, Ser. No. 478,326
Int. Cl.³ A61K *35/00*
U.S. Cl. 424—114 **12 Claims**

1. A pharmaceutical composition having enhanced antibacterial activity comprising a synergistically effective amount of a compound of formula (II):



(II)

or a pharmaceutically acceptable salt or pharmaceutically acceptable ester thereof wherein A is a hydrogen atom or an esterifying radical; X is an alkylene group of 1–12 carbon atoms optionaliy substituted by a hydroxy, amino, formyl, C_{1-6} alkanoyl, halo (C_{1-6}) alkanyl, acetyl or trifluoracetyl or C_{1-6} alkoxy group, which substituents are not on the carbon atom adjacent the nitrogen atom; or a C_{5-7} cycloalkyl group; or a phenylalkyl group wherein the carbon atom content of the alkyl part is 1–6 and the phenyl part is optionally substituted with a fluorine, bromine, chlorine, C_{1-6} alkyl, or C_{1-6} alkoxy; with the proviso that when X represents an optionally substituted phenylalkyl group and A represents C_{1-3} alkyl, then the —CO_2A group is attached to the alkyl part of the phenylalkyl group, together with an antibacterially effective amount of a penicillin and a pharmaceutically acceptable carrier.

4,539,203

CL-1577D AND CL-1577E ANTIBIOTIC/ANTITUMOR COMPOUNDS, THEIR PRODUCTION AND USE

Alex J. Brankiewicz, Southfield; Richard H. Bunge, Ann Arbor; James C. French, Ann Arbor; Gerard C. Hokanson, Ann Arbor; Timothy R. Hurley, Ann Arbor, and John P. Schaumberg, Ypsilanti, all of Mich., assignors to Warner-Lambert Company, Morris Plains, NJ

Filed Nov. 13, 1984, Ser. No. 670,240

Int. Cl.[3] A61K *35/74;* **C12P** *1/06*

U.S. Cl. 424—117 **8 Claims**

1. Sulfur-containing antibiotic compounds CL-1577D or CL-1577E Compound CL-1577D having the molecular formula $C_{55}H_{94}N_4O_{29}S_4$ characterized by the following properties:

(a) an ultraviolet absorption spectrum in methanol having absorption maxima at 320 (a=9.48), 281 (a=12.76), 252 (a=21.74), and 212 (a=22.48) nanometers;

(b) an infrared absorption spectrum in chloroform having absorption peaks at 2939, 1733, 1679, 1598, 1527, 1466, 1409, 1374, 1312, 1252, 1158, 1123, 1075, 1023, 989, and 963 reciprocal centimeters; and

(c) a 200 MHz nuclear magnetic resonance spectrum in deuterochloroform having principal signals at 1.10 (doublet), 1.23–1.40 (multiplet), 1.42–2.08 (multiplet), 2.10 (singlet), 2.00–2.55 (multiplet), 2.60–2.87 (multiplet), 3.39 (singlet), 3.30–4.16 (multiplet), 3.77 (singlet), 3.86 (singlet), 3.95 (singlet), 4.41–4.70 (multiplet), 4.97 (doublet), 5.21 (multiplet), 5.46 (multiplet), 5.67–5.91 (multiplet), 6.17 (singlet), 6.39 (multiplet), 7.47 (singlet), 8.58 (singlet), and 11.70 (singlet) parts per million downfield from tetramethylsilane;

Compound CL-1577E having the molecular formula $C_{55}H_{94}N_4O_{30}S_4$ characterized by the following properties

(a) an ultraviolet absorption spectrum in methanol having absorption maxima at 320 (a=10.04), 282 (a=13.58), 253 (a=22.08), and 213 (a=22.30) nanometers;

(b) an infrared absorption spectrum in chloroform having absorption peaks at 2939, 1734, 1679, 1601, 1527, 1466, 1410, 1376, 1312, 1249, 1181, 1158, 1121, 1078, 1040, 1017, and 954 reciprocal centimeters; and

(c) a 200 MHz nuclear magnetic resonance spectrum in deuterochloroform having principal signals at 1.09 (doublet), 1.15–1.50 (multiplet), 1.50–2.10 (multiplet), 2.20–2.40 (multiplet), 2.50 (singlet), 2.65–2.90 (multiplet), 2.78 (singlet), 3.39 (singlet), 3.30–4.10 (multiplet), 3.77 (singlet), 3.87 (singlet), 3.97 (singlet), 4.18 (singlet), 4.40–4.90 (multiplet), 5.00–5.30 (multiplet), 5.33–5.47 (multiplet, 5.60–5.95 (multiplet), 6.22 (singlet), 6.60 (multiplet), 7.56 (singlet), 8.62 (singlet), and 11.93 (singlet) parts per million downfield from tetramethylsilane.

4,539,204

GELATIN BASED SYNTHETIC BLOOD AND A METHOD OF MAKING THE SAME

Charles S. Ecanow, Skokie, and Bernard Ecanow, Wilmette, both of Ill., assignors to Neomed Inc., Wilmette, Ill.

Continuation-in-part of Ser. No. 437,823, Oct. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 336,061, Dec. 31, 1981, abandoned, which is a continuation-in-part of Ser. No. 222,364, Jan. 5, 1981, Pat. No. 4,343,797, which is a continuation-in-part of Ser. No. 146,029, May 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 47,071, Jun. 11, 1979, abandoned. This application Feb. 7, 1983, Ser. No. 464,704

Int. Cl.[3] A61K *37/12*

U.S. Cl. 514—6 **27 Claims**

1. A synthetic whole blood substitute comprising two gelatins, two modified fluid gelatins, or one gelatin and one modified fluid gelatin, having different isoelectric points, water, and sufficient alkaline substance to achieve a basic pH, said synthetic whole blood being a substantially non-polar coacervate phase.

11. A method of making a synthetic whole blood, said method comprising (a) combining water and two gelatins, two modified fluid geltins, or one gelatin and one modified fluid gelatin, with different isoelectric points, (b) storing the combination at 15°–40° C., for 12–72 hours whereby said combination separates into two layers, said lower layer being a substantially non-polar coacervate phase, and said upper layer being an equilibrium water phase, (c) separating said lower phase from said upper phase and (d) adjusting the pH of said lower phase to the range of from 7.2–7.6.

4,539,205

MODULATION OF ANIMAL CELLULAR RESPONSES WITH COMPOSITIONS CONTAINING 8-SUBSTITUTED GUANINE DERIVATIVES

Michael G. Goodman, Carlsbad, and William O. Weigle, Del Mar, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Nov. 9, 1982, Ser. No. 439,846

Int. Cl.[3] A61K *31/70;* **C12N** *5/00*

U.S. Cl. 514—45 **20 Claims**

1. A method of modulating animal cellular response comprising contacting animal cells with a composition suitable for modulating an immune response and including as an active ingredient an effective amount of 8-substituted guanine derivative bonded 9-1′ to an aldose having 5 or 6 carbon atoms in the aldose chain, said guanine derivative being free of electrically charged functionality, said 8-substituent having an electron withdrawing inductive effect greater than that of hydrogen and containing less than about 15 atoms, wherein said 8-substituent is selected from the group consisting of halo, mercapto, acyl mercapto, alkyl sulfido, nitro, cyano, keto, halomethyl, and methyleneoxy alkyl together with a diluent amount of a physiologically tolerable carrier.

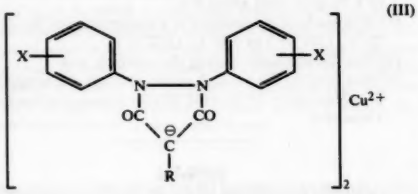
4,539,206

TOPICAL COMPOSITIONS CONTAINING COPPER (II) COMPLEXES OF 3,5-DIOXO-PYRAZOLIDINE DERIVATIVES AND METHODS OF COMBATTING INFLAMMATION WITH THEM

Barry Boettcher, New Lambton, and William R. Walker, Merewether, both of Australia, assignors to Alcusal Incorporated Pty. Ltd., New South Wales, Australia

Filed May 5, 1982, Ser. No. 375,047
Claims priority, application Australia, May 6, 1981, PE8726
Int. Cl.³ A61K *31/30, 31/415;* C07F *1/08*
U.S. Cl. 514—184 8 Claims

5. A method of combatting inflammation which comprises topically administering to a human or animal patient a copper complex of the formula (III)



(III)

wherein

X is H, OH, halo or C_1–C_{10} alkyl and

R is H or C_1–C_{10} alkyl

dissolved in a pharmaceutically acceptable non-aqueous lipophilic solvent enabling dermal penetration.

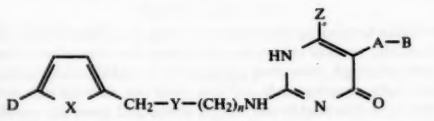
4,539,207

PYRIMIDINE COMPOUNDS

Thomas H. Brown, Welwyn Garden City, and Robert J. Ife, Stevenage, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 9,990, Feb. 7, 1979, Pat. No. 4,234,588. This application Jun. 4, 1980, Ser. No. 156,523
Int. Cl.³ C07D *401/12;* A61K *31/505*
U.S. Cl. 514—272 25 Claims

1. A compound of the formula:



in which D is hydrogen or $R^1R^2N(CH_2)_m$—, R^1 and R^2 are hydrogen, lower alkyl, phenyl(lower alkyl) or R^1 and R^2 taken together with the nitrogen atom shown can form a pyrrolidino or piperidino group, m is from 1 to 6, X is oxygen or sulphur, Y is sulphur, oxygen or methylene, n is 2 or 3, Z is hydrogen or lower alkyl, A is C_1–C_5 alkylene or $—(CH_2)_pW(CH_2)_q—$ where W is oxygen or sulphur and p and q are such that their sum is from 1 to 4, and B is hydrogen, methyl, C_3–C_6 cycloalkyl, a heteroaryl group selected from furyl, thienyl, thiazolyl, oxazolyl, isothiazolyl, imidazolyl, thiadiazolyl, benzimidazolyl and benzthiazolyl, said heteroaryl group being optionally substituted by one or more of the groups lower alkyl, lower alkoxy, halo, hydroxy and amino, or B is a naphthyl, or a 4- or 5-(1,3-benzodioxolyl) group, or a phenyl group optionally substituted with one or more lower alkyl, lower alkoxy, halogen, phenyl(lower alkoxy), hydroxy, lower alkoxylower alkoxy, trifluoromethyl, di(lower alkyl)amino, phenoxy, halophenoxy, lower alkoxyphenoxy, phenyl, halophenyl or lower alkoxyphenyl groups, in the form of the free base or its pharmaceutically acceptable acid addition salts.

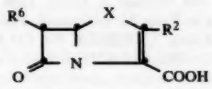
4,539,208

COMBINATION OF THIENAMYCIN-TYPE ANTIBIOTICS WITH DIPEPTIDASE INHIBITORS

Frederick M. Kahan, Scotch Plains, and Helmut Kropp, Kenilworth, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

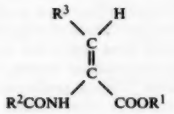
Continuation-in-part of Ser. No. 187,929, Sep. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 50,232, Jun. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 927,213, Jul. 24, 1978, abandoned. This application Aug. 10, 1981, Ser. No. 291,711
Int. Cl.³ A61K *31/425, 31/40, 31/22, 31/23, 31/19, 31/20, 31/195*
U.S. Cl. 514—195 34 Claims

1. An antibacterial composition comprising a combination of thienamycin-type compound of the formula



wherein X is CH_2 or S; R^2 is H; —S—C_1—C_6 alkyl; —S—$(CH_2)_2$—NHR^3 wherein R^3 is H, acetyl, formimidoyl, or acetimidoyl; —S(O)—CH=CHNHCOCH$_3$; or —S—CH=CHNHCOCH$_3$ and R^6 is H or

wherein R^7 is H, OH or sulfonyloxy and a dipeptidase (3.C.3.413.11) inhibitor compound of the following formula



wherein R^2 and R^3 are hydrocarbon radicals in the range respectively of 3–10 and 1–15 carbon atoms; in either one of these R^2 or R^3 hydrocarbon chains 1–6 hydrogens may be replaced by halogens or a nonterminal methylene may be replaced by oxygen or sulfur, including oxidized forms of the latter; additionally, a terminal hydrogen in R^3 can also be replaced by hydroxyl or thiol, which may be acylated or carbamoylated; or the hydrogen can be replaced by amino, which may be derivatized as in an acylamino, ureido, amidino, guanidino, or alkyl or substituted alkyl amino group, including quaternary nitrogen groupings; or, there may be replacement by acid groups such as carboxylic, phosphonic or sulfonic acid groups or esters or amides thereof, or cyano; or combinations thereof, such as a terminal amino acid grouping; and R^1 is hydrogen or lower alkyl (C_{1-6}) or dialkylaminoalkyl, or a pharmaceutically acceptable cation, the ratio of the thienamycin-type compound to the dipeptidase inhibitor being within the range of about 1:3 to about 30:1.

4,539,209

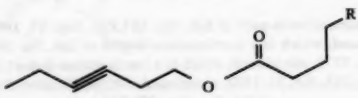
FOOD FLAVORING USE OF HEXYNYL ALKANOATES

Richard A. Wilson, Westfield; Braja D. Mookherjee, Holmdel; Michael J. Zampino, North Bergen; Manfred H. Vock, Locust, and Kevin P. Miller, Middletown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Dec. 7, 1984, Ser. No. 679,386
Int. Cl.³ A23L *1/226, 1/235*
U.S. Cl. 426—3 5 Claims

1. A process for augmenting or enhancing the aroma or taste of a tropical flavored foodstuff or tropical flavored chewing

gum comprising the step of adding to said consumable material from 0.5 ppm up to about 100 ppm based on the total composition of at least one hexynyl alkanoate defined according to the structure:



wherein R represents hydrogen or ethyl.

4,539,210

PROCESS FOR MAKING A STRUCTURED MEAT PRODUCT

Peter O'Connell, and Michael A. Gibbs, both of Los Angeles, Calif., assignors to Peter M. O'Connell, Philadelphia, Pa.

Filed Aug. 7, 1978, Ser. No. 931,501

Int. Cl.³ A23L *1/31*

U.S. Cl. 426—56 **35 Claims**

1. A process for making a structured meat product, comprising the steps of:

preparing chunks of lean meat substantially free of fat, gristle and sinew,

massaging said meat chunks, under a pressure of less than about 23.8 inches of mercury, and introducing sufficient water so as to obtain a controlled protein-to-water ratio in the massaged meat chunks, said massaging being carried out for a sufficient time and at a temperature so as to produce a sticky protein exudate on said chunks, and

simultaneously extruding said massaged meat chunks and an extrudable emulsion of fat through separate but adjacent extrusion heads to form a shaped structured meat product having a lean meat region comprising said massaged meat chunks bound together by said protein exudate and a contiguous fat region formed of said extruded fat emulsion and bound to said meat region by said protein exudate, said extrudable fat emulsion having a paste-like consistency, said extrusion being performed at a temperature wherein the extruded meat chunks and fat emulsion achieve integrity and maintain their extruded shape.

4,539,211

PROCESS FOR MANUFACTURING CAVITY-FILLED CEREAL PIECES

Toni E. Armando, Cary; John R. Brewer, Barrington; Leroy F. Duvall, Crystal Lake, and John C. Novotny, Hebron, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 11, 1983, Ser. No. 522,428

Int. Cl.³ A23L *1/10, 1/164*

U.S. Cl. 426—291 **8 Claims**

1. A method for manufacturing a filled composite food product comprising the steps:

(a) charging into a revolvable vessel larger and smaller food pieces, said larger pieces being dry solid pieces having external exposed surfaces and having substantial recess or cavities bounded by sheltered surfaces, and said smaller solid pieces being small enough to reside within said recesses or cavities, said larger and smaller pieces being of sufficient quantity as to form a bed in said vessel;

(b) charging to said vessel a low viscosity non-tacky liquid of sufficient quantity to slideably adhere smaller pieces to larger pieces, said liquid containing a non-volatile bonding material, said quanity of liquid not being of sufficient quantity to provide free excess drainable liquid;

(c) rotating the vessel to tumble said bed, thereby concentrating the smaller pieces in the recesses or cavities of the larger pieces, and then;

(d) drying the resulting pieces to a sufficient low moisture level for said bonding material to immovably bond said smaller pieces to said sheltered surfaces.

4,539,212

STERILIZATION AND STABILIZATION PROCESS FOR MEAT ANALOG PRODUCTS

John E. Hunter, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 500,699, Jun. 3, 1983, abandoned. This application May 7, 1984, Ser. No. 606,272

Int. Cl.³ A23B *4/12;* **A23L** *3/16, 3/34*

U.S. Cl. 426—325 **10 Claims**

1. A process for preventing spoilage while maintaining flavor quality in a low-acid food product containing textured vegetable protein, comprising the steps of:

(a) acidifying the food product to a pH of from about 4.2 to about 4.6 and an organic acid level of about 0.4% to about 0.75%;

(b) high temperature short-time sterilizing the food product to a F_0 of at least about 0.3;

(c) then packing the product at a temperature of from about 85° C. (185° F.) to 100° C. (212° F.);

(d) then hermetically sealing the product; and

(e) then holding the packed, sealed product at a temperature of at least about 85° C. (185° F.) for a time of at least about 3 minutes.

4,539,213

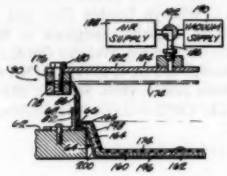
METHOD FOR MAKING DEEP DISH PIZZA CRUSTS OR THE LIKE

Miles R. Cherkasky, 833 E. Washington St., Appleton, Wis. 54912, and Ernest V. Canamero, Green Bay, Wis., assignors to Miles R. Cherkasky, Appleton, Wis.

Division of Ser. No. 472,555, Mar. 7, 1983, Pat. No. 4,500,276. This application May 24, 1984, Ser. No. 613,237

Int. Cl.³ A21C *3/02, 11/10*

U.S. Cl. 426—512 **3 Claims**



1. An automated method for forming pie crusts having substantially vertical sidewalls, comprising the steps of providing disks of dough, providing pie pans having substantially vertical sidewalls; draping each said disk over one said pie pan; positioning a distendable diaphragm above and generally parallel to each said disk; applying fluid pressure to said diaphragm, thereby distending said diaphragm against said disk and conforming said disk against said pan, forming said disk into a crust; and removing said fluid pressure, thereby releasing said diaphragm from said crust.

4,539,214

METHOD OF PRODUCING PASTA

Maurice J. Winter, Great Yarmouth, and Peter R. Dawe, Norwich, both of England, assignors to Ranks Hovis McDougall p.l.c., Berkshire, England

Continuation-in-part of Ser. No. 409,653, Aug. 19, 1982, abandoned, which is a continuation of Ser. No. 209,532, Nov. 24, 1980, abandoned. This application Nov. 9, 1983, Ser. No. 550,241

Int. Cl.³ A23L *1/16*

U.S. Cl. 426—557 **2 Claims**

1. A rapidly rehydratable pasta product having an outer zone in which most or all of the protein is denatured and most or all of the starch is gelatinized and having a central core in which a substantial amount of the protein is undenatured and a substantial amount of the starch is ungelatinized, said pasta

product being produced by preparing a mixture consisting substantially entirely of wheat flour and water, having a moisture content of between 28% and 40%, extruding the mixture through a die and cutting it into lengths to form a cut product having a thickness between 0.3 and 0.7 millimeters, and then simultaneously cooking and drying said cut product by subjecting said cut product to superheated steam in the absence of water at a temperature between 102° C. and 140° C. for from seven to twenty minutes to yield a shelf-stable product without cracking or checking, said cut product being left in an unexpanded state at all times throughout said method and at the start of said simultaneous cooking and drying step having a moisture content of between 24% and 40%, said simultaneous cooking and drying step reducing the moisture content of said cut product to below 14% and leaving each piece of said product with an outer zone in which most or all of its protein is denatured and most or all of its starch is gelatinized and with a central core in which a substantial amount of the protein is undenatured and a substantial amount of the starch is ungelatinized, said outer zone and central core being of such sizes that said product is rapidly rehydratable in boiling water in under ten minutes because of the presence of said outer zone and yet after such rehydration exhibits a definite al dente texture because of the presence of said central core.

4,539,215

EMULSIFICATION SYSTEM FOR CREAMY FOOD PRODUCTS

Jeffrey M. Schweid, Dover, Del.; Arthur H. Cohee, Ridgely, Md., and Anthony F. Dec, Dover, Del., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jul. 7, 1983, Ser. No. 511,617

Int. Cl.³ A23L *1/24, 1/04, 1/187*

U.S. Cl. 426—589 **7 Claims**

1. An emulsification system for food products which requires a mild hand shaking to form an emulsion having a creamy texture said system being consisting essentially of polysorbate 60, xanthan gum and lecithin solids at a weight ratio of 0.3–6:0.3–4:1.

4,539,216

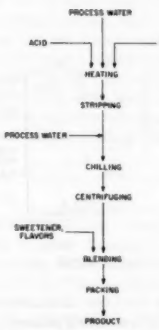
PROCESS FOR PREPARING TEA PRODUCTS

Hing C. Tse, Fairfield, Ohio, assignor to The Procter & Gamble Co., Cincinnati, Ohio

Filed May 25, 1984, Ser. No. 614,419

Int. Cl.³ A23F *3/16*

U.S. Cl. 426—597 **15 Claims**



1. A process for the preparation of a shelf-stable liquid tea mix concentrate having a pH of below about 3.0, a water activity of about 0.75 to about 0.85 and a maximum sulfur content of less than 0.005% comprising:

(a) acidifying a tea extract by adding from about 0.05% to about 40% by weight of a tea-acid-water mixture of an edible food grade acid, the tea extract prepared by mixing tea leaves with water in a ratio of from about 1:3 to about 1:50, extracting at from about 100° F. to about 210° F. for about 3 to about 100 minutes and separating the tea leaves from the extract, or mixing dehydrated tea extract with water, the dehydrated tea extract comprising from about 0.5% to about 30% by weight of the tea extract and water mixture;

(b) heating the acidified extract to a temperature of at least 120° F. for at least about 15 minutes to develop malodorous and off-flavor degradation compounds;

(c) removing malodorous and off-flavor degradation volatiles from the acidified heated extract by stripping, evaporation, flash evaporation or boiling; and

(d) cooling the extract to a temperature of from about 15° F. to about 50° F. and separating solids from the extract to yield a clarified shelf-stable tea concentrate.

4,539,217

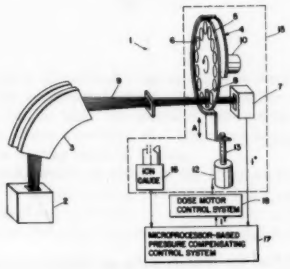
DOSE CONTROL METHOD

Marvin Farley, Ipswich, Mass., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 27, 1984, Ser. No. 625,263

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—10 **4 Claims**



1. A method for controlling the dose of ions implanted into a workpiece by an ion implanter comprising the steps of measuring the ionized beam current at the workpiece, determining the current of the neutral atoms present in the beam striking the workpiece, adding the ionized beam current and the neutral beam current to obtain an effective beam current, and varying the dose of implantation as a function of the effective beam current.

4,539,218

SYNTHETIC RESIN

Michael Geist, Münster, Fed. Rep. of Germany, assignor to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 399,292, Jul. 19, 1982, Pat. No. 4,522,981. This application Jan. 2, 1985, Ser. No. 688,198

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130545

Int. Cl.³ B01D *5/00*

U.S. Cl. 427—27 **8 Claims**

1. A powder finish applied to a substrate containing as essential binder a synthetic resin based on an acrylate copolymer containing epoxide groups and having a number average molecular weight of 1,000 to 30,000, said acrylate copolymer comprising:

(a) 20 to 90% by weight of a first acrylate selected from the group consisting of alkyl acrylate having 1 to 18 carbon atoms in the alkyl radical and alkyl methacrylate having 1 to 20 carbon atoms in the alkyl radical;

(b) 5 to 40% by weight of a second acrylate having hydroxyl

groups selected from the group consisting of hydroxyalkyl acrylate and hydroxyalkylmethacrylate; and

(c) 5 to 40% by weight of monomers containing epoxide groups selected from the group consisting of glycidyl acrylate and glycidyl methacrylate, the total amount of components (a), (b) and (c) being 100%; and said hydroxyl groups of said second acrylate having been reacted in solution at 60°–100° C. with a partially blocked isocyanate selected from the group consisting of diisocyanate and polyisocyanate to a free isocyanate content of less than 1% and, upon subsequent baking at an elevated temperature, isocyanate groups are liberated from said blocked isocyanate to react with said epoxide groups of component (c) to form oxazolidinone rings.

4,539,219
METHOD FOR COATING OPTICAL TRANSMISSION GLASS FIBERS

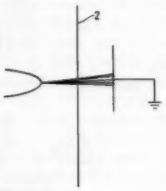
Toru Yamanishi; Katsuyuki Tsuneishi, and Masaaki Yoshida, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 529,779, Sep. 6, 1983, Pat. No. 4,512,281. This application Jan. 16, 1985, Ser. No. 691,791

Claims priority, application Japan, Sep. 3, 1982, 57-154335; Dec. 22, 1982, 57-223896

Int. Cl.³ B05D *1/04*

U.S. Cl. 427—32 **1 Claim**



1. A method for resin-coating an optical transmission glass fiber comprising the steps of:

spinning an optical transmission glass fiber around a longitudinal axis thereof;

spraying particles of a resinous composition toward said glass fiber; and

charging said particles with a charge of a polarity opposite a polarity of said fiber.

4,539,220
METHOD OF MANUFACTURING REINFORCED FLEXIBLE DISKS

Lawrence G. Martinelli, San Jose, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Sep. 23, 1983, Ser. No. 535,402

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—44 **15 Claims**

1. A method of manufacturing a flexible recording disk with a reinforced aperture region comprising the steps of:

transferring a quantity of uncured polymeric material from a reservoir to an elastomeric protrusion of a printing plate, said elastomeric protrusion having a surface thereon which is the shape of a pattern for printing said polymeric material;

transferring at least a portion of said quantity of uncured polymeric material from said elastomeric protrusion of said printing plate to a first surface of a flexible magnetic material, the polymeric material so transferred being in the shape of said pattern for printing said polymeric material;

curing the polymeric material on said first surface of said flexible magnetic material;

cutting a flexible disk from the flexible magnetic material with a central aperture of the flexible disk in a region of the magnetic material coated with the cured polymeric material;

whereby said disk is produced in a configuration having structural reinforcement provided in the region of its central aperture by a coating of cured polymeric material.

4,539,221
PROCESS FOR THE CHEMICAL VAPOR DEPOSITION OF OXIDIC PARTICLES

Herbert Jacob, Burghausen; Robert Rurländer, Emmerting, and Anton Schnegg, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe m.b.H., Burghausen, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,602

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1983, 3335126

Int. Cl.³ B05D *3/06;* **C03B** *37/07, 37/075*

U.S. Cl. 427—53.1 **4 Claims**

1. In a process for the chemical vapor deposition of oxidic particles by oxidation of a gas current impinged upon by a halide or a halide mixture in a substantially homogeneous vapor phase reaction, the improvement comprising the steps of:

oxidizing said gas current by using dinitrogen monoxide as the oxidizing agent and reacting the same with a halide-containing gas current in a heating zone having a temperature betwen 900 and 1150° C.

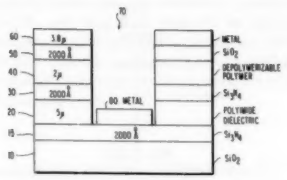
4,539,222
PROCESS FOR FORMING METAL PATTERNS WHEREIN METAL IS DEPOSITED ON A THERMALLY DEPOLYMERIZABLE POLYMER AND SELECTIVELY REMOVED

Herbert R. Anderson, Jr., Patterson; Constance J. Araps, Wappingers Falls, and Catherine A. Lotsko, Beacon, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1983, Ser. No. 556,733

Int. Cl.³ H01L *21/285*

U.S. Cl. 427—88 **27 Claims**



1. A process for forming a metal pattern on a substrate which comprises:

forming a mask of at least one thermally depolymerizable polymer on the substrate with a pattern of openings complementary to the desired metal pattern;

blanket coating the substrate and the mask with a metal;

heating to thermally depolymerize the thermally depolymerizable polymer; and

thereafter immersing the resulting assembly in a solvent to lift-off the depolymerized polymer and any metal thereover leaving metal in the desired pattern on the substrate.

4,539,223

THICK FILM RESISTOR COMPOSITIONS

Jacob Hormadaly, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1984, Ser. No. 683,634

The portion of the term of this patent subsequent to Oct. 9, 2001, has been disclaimed.

Int. Cl.[3] B05D *5/12*

U.S. Cl. 427—102 8 Claims

1. A resistor composition which is an admixture of finely divided particles of (a) 4–75% wt. ruthenium-based conductive materials, (b) 96–25% wt. nonconductive glass, and (c) 0.05–15% wt. Co_2RuO_4 dispersed in organic medium.

4,539,224

METHOD FOR REINFORCING A CERAMIC SHAPED BODY

Tadaaki Matsuhisa, Kasugai, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Jun. 24, 1983, Ser. No. 507,592

Claims priority, application Japan, Aug. 28, 1982, 57-149786

Int. Cl.[3] B05D *3/02*

U.S. Cl. 427—190 5 Claims

1. A method for reinforcing a ceramic body, comprising: applying a coating of a slip composition on a shaped ceramic body, said coating having substantially the same chemical composition as the ceramic body after firing thereof, said coating being applied by a coating process selected from the group of processes consisting of spraying the coating on the shaped ceramic body, brushing the coating on the shaped ceramic body and immersing the shaped ceramic body in the coating; drying the coated shaped body; then hydrostatically pressing the coated shaped body; and then firing the coated shaped body to obtain a fired ceramic body, whereby after firing the coefficient of thermal expansion at 800° C. of the coating differs from that of the fired ceramic body by not more than 0.1%.

4,539,225

METHOD FOR THE PRODUCTION OF A HEAT-SENSITIVE RECORD MATERIAL

Kazuo Kojima; Hitoshi Yamahira, both of Osaka, and Yoshitaka Oeda, Kamimachi, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,123

Claims priority, application Japan, Feb. 23, 1983, 58-29977

Int. Cl.[3] B41M *5/18*

U.S. Cl. 427—150 5 Claims

1. A method of the surface treatment of a heat-sensitive record material comprising a base sheet having a heat-sensitive record layer coated thereon, which method comprises passing said record material through a nip between a metal roll and an elastic roll of from 42° to 69° Shore-D hardness defined by ASTM Standard, D-2240, with said coated layer being in contact with said metal roll, at a nip pressure enough to obtain a Bekk smoothness of 150 seconds or above on the surface of said record layer.

4,539,226

HIGH SPEED LIGHTGUIDE COATING APPARATUS

Un C. Paek, West Windsor Township, Mercer County, and Charles M. Schroeder, Jr., North Hanover Township, Burlington County, both of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Mar. 2, 1984, Ser. No. 585,659

Int. Cl.[3] B05D *5/06, 1/18;* G02B *5/14*

U.S. Cl. 427—163 4 Claims

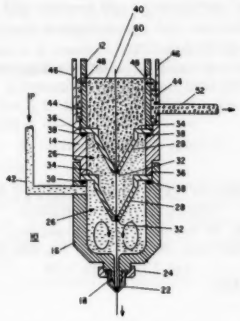
1. A method of coating a lightguide fiber, comprising the steps of:

drawing the fiber through a container, filled with coating material, having at least three vertically aligned chambers therein, each chamber being sealed from the others and each having a small aperture in the lower portion thereof through which the fiber is drawn; and

pressurizing the lower chamber to a pressure higher than the chambers thereabove wherein the pressure in the lower chamber causes the coating material to continuously flow upward, through the apertures in the lower portions of the chambers thereabove, and out an overflow means in the upper chamber.

2. An apparatus for coating a lightguide fiber, which comprises:

a container, having a coating die in the bottom portion



thereof, and a plurality of separating means therein which divides the container into an upper chamber, a lower chamber and at least one chamber intermediate to the upper and lower chambers, said chambers being adapted to contain coating material therein;

each separating means is sealed to the inner surface of the container at the outer edge portion and has a small, centrally located aperture which is vertically aligned with the apertures in the other separating means and the coating die; and

a means for directing coating material, under pressure, into the lower chamber.

4,539,227

METHOD OF MAKING A METALLIC SOAP LAYER AS A GLIDING LAYER ON A METALLIZED RECORD CARRIER

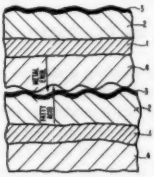
Marian Briska, Rottenburg-Baisingen, and Dietrich J. Bahr, Herrenberg, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 18, 1984, Ser. No. 572,087

Claims priority, application European Pat. Off., Jan. 21, 1983, 83100529.3

Int. Cl.[3] B05D *3/10, 5/08*

U.S. Cl. 427—179 5 Claims



1. The method of making a record carrier having a recording surface provided with a sufficiently thick gliding layer wherein the record carrier comprises a support layer, a first lacquer layer coated on one surface of said support layer, a second lacquer layer coated on the opposite surface of said support

layer, and an aluminum layer formed on said first lacquer layer to provide said recording surface, said record carrier being made according to the improved steps of:

providing in one of said first and second lacquer layers at least one admixed fatty acid,

providing in the other of said first and second lacquer layers a metal complex comprising a metal-diketone or a metal keto-ester either of whose hydrogen form shows a distinct keto-enoltautomerism, said metal complex being admixed at approximately a stoichiometric ratio to the fatty acids in said one layer,

forming said aluminum layer in a vacuum,

winding said carrier into a roll to place said second lacquer layer in contact with said aluminum layer, and

storing said wound carrier;

thereby forming a gliding layer resulting from the reaction of said fatty acid and said metal complex.

4,539,228

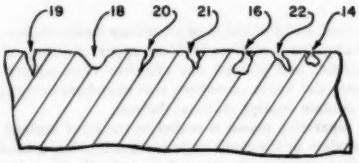
METHOD OF EXTENDING USEFUL LIFE OF INSTRUMENT STRINGS

Arnold Lazarus, 39 Seward St., San Francisco, Calif. 94114

Filed Oct. 29, 1984, Ser. No. 666,274

Int. Cl.³ B05D *1/18*

U.S. Cl. 427—180 **6 Claims**



1. A method of treating metal musical instrument strings including wound strings to reduce break-in period and extend useful lifetime comprising the steps of

cleaning said strings to remove abrasive particles, and

fill microscopic pores, cavities and crevices of the strings and the interstices of wound strings with dry lubricant particles.

4,539,229

METHOD OF PROVIDING A SHAPED CARBON ARTICLE

Franz Schieber, Röthenbach a.d.Pegnitz, Fed. Rep. of Germany, assignor to C. Conradty Nürnberg GmbH & Co KG, Röthenbach a.d. Pegnitz, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,010

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323800

Int. Cl.³ B05D *7/00*

U.S. Cl. 427—215 **4 Claims**

1. A method for providing a shaped carbon article of low bulk density and high porosity, comprising the steps of:

providing paper particles in platelet form having an average diameter of from 0.5 to 5 mm and an average thickness of from 0.01 to 1 mm or in strip form having an average length of from 5 to 100 mm, an average width of from 0.5 to 10 mm and an average thickness of from 0.01 to 1 mm, the paper particles having an ash content of from 0.005 to 5% by weight, impregnating the paper particles with a carbon-containing binder, shaping the paper particles to form an article, and subjecting the article to temperature treatments for condensation and carbonization .

4,539,230

METHOD FOR PREVENTING DEPOSITION OF POLYMER SCALE AND A COATING AGENT THEREFOR

Toshihide Shimizu, Chiba; Ichiro Kaneko, and Yoshiteru Shimakura, both of Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1984, Ser. No. 601,052

Claims priority, application Japan, Apr. 28, 1983, 58-75557

Int. Cl.³ B05D *7/22*; C08F *2/00*

U.S. Cl. 427—230 **7 Claims**

1. A method for preventing deposition of polymer scale on the walls of a polymerization reactor in the course of a polymerization reaction of an ethylenically unsaturated monomer or a mixture of ethylenically unsaturated monomers which comprises the steps of:

(a) coating the reactor walls with a coating composition comprising:

(A) an organic compound having at least 5 conjugated π bonds in a molecule,

(B) a chelating agent, and

(C) a metal compound capable of producing metal ions having a coordination number of at least 2, as dissolved or dispersed in a solvent; and

(b) drying the thus coated reactor walls, prior to introduction of the polymerization mixture into the polymerization reactor.

4,539,231

METHOD FOR SEALING A CERAMIC MOLDING

Wolfgang Betz, and Werner Hüther, both of Munich, Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

PCT No. PCT/DE78/00001, § 371 Date Apr. 16, 1979, § 102(e) Date Apr. 16, 1979, PCT Pub. No. WO79/00101, PCT Pub. Date Mar. 8, 1979

PCT Filed Jun. 1, 1978, Ser. No. 503,196

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737173

Int. Cl.³ B05D *1/18, 3/00*; C23C *11/00, 13/00*

U.S. Cl. 427—255 **10 Claims**

1. Method for sealing a ceramic molding without encapsulating or forming a surface layer, especially a silicon ceramic molding for hot isostatic pressing, characterized in that the molding is first evacuated and then filled with nitrogen gas (N_2) before it is immersed in a silicon melt, said immersion thereby forming Si_3N_4 plugs within the pores to seal the pores and thereby obviate the need for a surface layer coating before said isostatic pressing.

4,539,232

SOLVENTLESS LIQUID ORGANOPOLYSILOXANES

Alfred J. Burzynski, and Edward J. Stengle, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 384,465, Jun. 3, 1982, abandoned, which is a continuation-in-part of Ser. No. 306,577, Sep. 29, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 517,498

Int. Cl.³ A23F *2/00*

U.S. Cl. 427—387 **9 Claims**

1. A process for producing a solventless organopolysiloxane resin that is liquid at room temperature, the process including the steps of:

hydrolyzing, in an aqueous system, by heating a hydrolyzable organo silicon composition comprising at least one compound having the general formula:

$$Y_{(4-n)}Si(OR)_n$$

where Y is phenyl or methyl, R is an alkyl group having from one to three carbon atoms, and n is an integer from one to four, wherein the ratio of OR groups to silicon atoms in the composition is from about 2.3:1 to 3.1:1, the

molar ratio of water/silane being about 1.5:1 to 2.25:1, and the amount of acid present expressed as HCl being about 2.3 to 1192 parts of HCl per million parts of silane and water to form a siloxane partial condensation product,

concentrating the partial condensation product by heating to cause substantial siloxane formation by condensation and to distill therefrom water and alcohol by-products,

precuring the concentrated partial condensation product by heating the product to remove volatile material at a temperature equivalent to that of about 140° C. to 160° C. for about 2 hours, and

cooling the precured product to room temperature to provide a solventless organopolysiloxane that has a viscosity at 25° C. measured by a Brookfield LVT viscometer using a #3 spindle at 60 rpm of at least about 25 cps. but not greater than 10,000 cps, the solventless organopolysiloxane having a water content by weight of less than about 1 percent.

4,539,233

COATING FRICTION MATERIAL WITH ALKANOLAMINE-CARBOXYLIC ACID SALTS

Donald J. Melotik, Dearborn Heights; Marvin H. Weintraub, West Bloomfield, and Arnold E. Anderson, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 456,931, Nov. 22, 1982, Pat. No. 4,456,650. This application Mar. 5, 1984, Ser. No. 560,098

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—388.1 **12 Claims**

1. A method for using alkanolamine-carboxylic acid salts as a coating for friction materials which during use contact rustable metals, which method comprises:

(A) contacting said friction material with an aqueous solution comprising at least about 0.05 weight percent said alkanolamine-carboxylic acid salts which are the reaction product of:

(i) one or more alkanolamines; and

(ii) one or more C_4–C_{20} carboxylic acids;

(B) evaporating water from the aqueous coating on said friction material so as to leave said friction material with a coating comprising said alkanolamine carboxylic acid salts.

4,539,234

URETHRAL CATHETER CAPABLE OF PREVENTING URINARY TRACT INFECTION AND PROCESS FOR PRODUCING THE SAME

Izumi Sakamoto, and Kunihiko Takagi, both of Kyoto, Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed May 27, 1982, Ser. No. 382,743

Claims priority, application Japan, May 27, 1981, 56-81474; Nov. 13, 1981, 56-182729

Int. Cl.³ A61M *25/00;* **B05D** *3/02*

U.S. Cl. 427—393.5 **7 Claims**

1. A process for producing a urethral catheter capable of preventing urinary tract infection which comprises forming a film having functional groups capable of being converted into ion-exchange groups by hydrolysis on the inside wall and/or the outside wall of a urethral catheter composed of olefin polymer, diene polymer or silicone polymer as a base material by reacting two or more compounds on said inside wall and/or said outside wall, thereafter hydrolyzing said functional groups in the film, and bonding ionically the resulting ion-exchange groups with an antimicrobial substance

wherein said ion-exchange groups are carboxyl groups; said carboxyl groups are obtained by reacting (A) a copolymer of maleic acid anhydride and a copolymerizable compound with (B) a polyfunctional compound having hydroxyl groups under a condition of an excess amount of the copolymer of maleic acid anhydride and a copolymerizable compound (A) and thereafter hydrolyzing the acid anhydride groups; and the copolymer of maleic acid anhydride and a copolymerizable compound is a mixture of (I) about 0.5 to about 99.5 parts by weight of a copolymer of maleic acid anhydride and a copolymerizable vinyl monomer or olefin monomer and (II) about 0.5 to about 99.5 parts by weight of a copolymer of maleic acid anhydride and copolymerizable aliphatic vinyl ester or aliphatic vinyl ether.

4,539,235

METHOD FOR TREATING WOOD

Albert V. Collins, Fairview Park, and Richard W. Asmus, Lakewood, both of Ohio, assignors to Mooney Chemicals, Inc., Cleveland, Ohio

Division of Ser. No. 557,770, Dec. 2, 1983, Pat. No. 4,507,152, which is a continuation-in-part of Ser. No. 416,101, Sep. 9, 1982, abandoned, which is a continuation-in-part of Ser. No. 386,659, Jun. 9, 1982, abandoned. This application Nov. 19, 1984, Ser. No. 673,188

Int. Cl.³ B05D *1/18;* **C09D** *5/16*

U.S. Cl. 427—440 **21 Claims**

1. A method of rendering wood resistant to fungus and insects comprising

(a) contacting the wood with an aqueous system comprising

(i) at least one oil-soluble metal salt of an organic carboxylic acid having fungicidal properties wherein the metal is zinc, chromium, iron, antimony, lead, mercury, or a mixture thereof,

(ii) at least one halopyridyl phosphate of the formula

wherein R represents a halopyridyl group, Z represents oxygen or sulfur, and each R' is independently a lower alkoxy, amino or lower alkylamino group,

(iii) at least one surfactant, and

(iv) from about 60 to 99% of water for a period of time sufficient to enable the metal salt and halopyridyl phosphate to penetrate into the wood, and

(b) removing the wood from contact with the aqueous system.

4,539,236

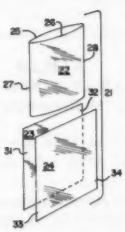
LAMINATED MULTI-LAYERED FILM ENCLOSURES

Leonard J. Vilutis, Frankfort, Ill., assignor to Vilutis & Co., Inc., Frankfort, Ill.

Division of Ser. No. 326,701, Dec. 2, 1981, Pat. No. 4,450,028. This application Jan. 26, 1984, Ser. No. 574,017

Int. Cl.³ B32B *31/26;* **B29C** *17/00*

U.S. Cl. 428—35 **20 Claims**



1. A multi-layered enclosure, comprising:

a length of collapsed extruded tubing having two panels integral with each other, said panels being integrally joined along two common longitudinal edges that are continuous with both of said two tubing panels;

one length of extruded sheeting having two longitudinal edges complementary to said tubing longitudinal edges, said one length of sheeting overlying one of said tubing panels;

another length of extruded sheeting having two longitudinal edges complementary to said tubing longitudinal edges, said another length of sheeting overlying the other of said two tubing panels; and

said length of extruded tubing, said one length of extruded sheeting and said another length of extruded sheeting are laminated to each other into a multi-layered enclosure in which said one length of sheeting is laminated to substantially the entire outside surface of said one tubing panel, in which said another length of sheeting is laminated to substantially the entire outside surface of said other tubing panel, in which one of said two longitudinal edges of the one length of sheeting is laminated to one of said two longitudinal edges of the another length of sheeting to form one longitudinal edge section, and in which the other of said two longitudinal edges of the one length of sheeting is laminated to the other of said two longitudinal edges of the another length of sheeting to form another laminated edge section.

4,539,237

FASTENING APPARATUS FOR TWIST TIES

William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,503
Int. Cl.³ B32B *3/28*
U.S. Cl. 428—40 **11 Claims**

1. A twist tie system whereby a plurality of edgeconnected, separable twist ties forming a gang of twist ties can be fastened to a surface, said system comprising:

a material fastened at a first portion thereof to a surface of said gang of twist ties, said material having a second portion which is covered with an adhesive and which is exposable to permit fastening of said material and gang of twist ties to a surface by means of said adhesive covered second portion.

4,539,238

TEAR-AWAY WINDOW SHADE

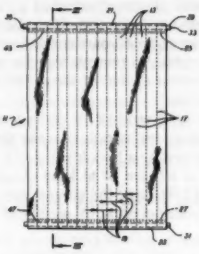
Steven L. Markowitz, 719 Greenwich St., No. 2 S., New York, N.Y. 10014

Filed Jun. 14, 1984, Ser. No. 620,479
Int. Cl.³ A47G *5/02*; B65D *65/28*
U.S. Cl. 428—43 **12 Claims**

1. A window shade comprising:

a multiplicity of elongate fabric strips of substantially equal length disposed laterally adjacent to each other in substantially the same plane; and

attachment means including a multiplicity of fibers each threadingly engaging in a knitted stitch a respective pair of adjacent fabric strips along the lengths thereof for forming a tying link between said pair of adjacent fabric strips to hold same substantially in contact with one another, said fibers being separate from the fabric of said strips, said attachment means being deformable, upon the manual application of a force exceeding a predetermined



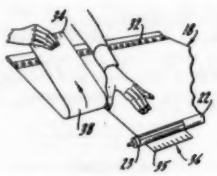
threshold, for severing said link and thereby enabling the disengagement and separation of said adjacent fabric strips from one another.

4,539,239

WINDOW SHADE, AND METHOD APPARATUS FOR MANUFACTURING SAME

Delbert E. Graves, Nora, and George E. Craft, Freeport, both of Ill., assignors to Newell Companies, Inc., Freeport, Ill.

Continuation of Ser. No. 138,569, Apr. 8, 1980, abandoned, which is a continuation of Ser. No. 758,426, Jan. 11, 1977, abandoned. This application Sep. 23, 1981, Ser. No. 304,808
Int. Cl.³ A47G *5/02*
U.S. Cl. 428—43 **8 Claims**



1. In a flexible sheet member for use in a window shade assembly wherein the sheet member is composed of a sheet of flexible plastic material; said sheet member having at least one line of weakness therein which is invisible to the naked eye; said line of weakness, or lines of weakness, extending from the top end portion to the bottom end portion of the sheet and along at least one edge portion thereof; each of said lines of weakness being formed by a continuous cut which penetrates into the sheet member only a portion of the thickness of said plastic sheet material; each of said lines of weakness being generally parallel to one another and so formed that, upon peeling two portions of the sheet material apart along one of said lines of weakness, a straight edge is formed on each separated sheet portion; the improvement characterized in that

said plastic sheet member includes a body of said plastic material defined by an upper surface on one side and a lower surface on the other side;

said continuous cut is formed in said upper surface of the plastic sheet member;

said upper surface of the plastic sheet member in which the continuous cut is formed has peaks and valleys;

the vertical distance between a peak and an adjacent valley on said upper surface of the plastic sheet member is substantial, being as much as approximately the depth of the cut which is formed in the sheet member;

each of the continuous cuts penetrates into the plastic sheet member to a substantially constant depth from said upper

surface at all locations along the length of the cut from at least the top end portion to the bottom end portion of the plastic sheet member;

said lower surface of the plastic sheet member which does not contain the continuous cut has peaks and valleys located generally opposite the peaks and valleys in said upper surface in which the continuous cut is formed; and

the uncut body portion of the sheet member lying beneath the continuous cut is of a substantially uniform thickness along the entire length of the uncut body portion.

4,539,240

ASBESTOS FREE FRICTION ELEMENT

Robert V. Wargin, Sao Paulo, Brazil, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 29, 1984, Ser. No. 676,144

Int. Cl.³ B32B *3/02*

U.S. Cl. 428—64 **5 Claims**

1. In a friction element adapted for use in a clutch, said friction element comprising fiber strands impregnated with a binder resin composition and disposed in an undulating fashion and then cured to form a disc-shaped facing, the improvement wherein said fiber strands are in the form of a plied yarn comprising from about 30 to about 70 wt. % glass fiber, from about 15 to about 25 wt. % acrylic fiber and from about 15 to about 45 wt. % metallic filament.

4,539,241

PROCEDURE FOR MANUFACTURING A BUILDING ELEMENT, AND THE BUILDING ELEMENT

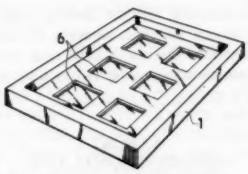
Raimo Kainulainen; Antti Sipponen, both of Mastotie 10, 17300 Vääksy, and Tuomo Toivola, Mäyräntie 2 as. 9, 49210 Huutjärvi, all of Finland

Filed Mar. 15, 1982, Ser. No. 357,881

Claims priority, application Finland, Mar. 17, 1981, 810827; Mar. 17, 1981, 810828; Feb. 5, 1982, 820373

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—71 **14 Claims**



1. A procedure for manufacturing a light weight and rigid building element, wherein at least two surface sheets of the element are affixed to opposite sides of a frame, apertures are made in at least one of said surface sheets, and the apertures are each covered with a sheet part, and an insulation bonding and sealing material is placed between the sheets, sheet parts, and the frame, said insulation consisting of polyurethane which is injected into the interspace between the surface sheets and the frame in such a manner that the insulation fills all the space and becomes glued fast to the sheets and to the frame, thereby providing a light weight and rigid building element.

4,539,242

PILE FABRIC WITH NON-MUSHROOM SHAPED CUT ENDS

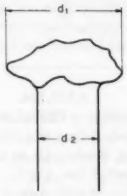
Yoshiyuki Sasaki, Takatsuki; Shigenobu Kobayashi, Toyonaka; Tetsuo Okamoto, Ibaraki, and Norihiro Minemura, Takatsuki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jun. 5, 1984, Ser. No. 617,593

Claims priority, application Japan, Jun. 7, 1983, 58-100144; Jun. 10, 1983, 58-102841

Int. Cl.³ B32B *3/02*

U.S. Cl. 428—92 **12 Claims**



1. A pile fabric comprising a plurality of piles of thermoplastic synthetic fiber having a breakage strength of less than 2.8 g/De, a primary yield strength of more than 1.2 g/De, a primary yield elongation of at least 10%, and a boiling water contraction of less than 3.0% or a hot air contraction at 160° C. of less than 5.0%, at least 50% of the piles being cut piles having cut ends at tip portions thereof, characterized in that an average value of a maximum diameter d_1 of said tip portions of said cut piles satisfies the equation

$$d_1/d_2 \geq 1.3,$$

where d_2 is the average value of a diameter of the remaining portion of said cut piles other than said tip portions.

4,539,243

GLAZING SYSTEM

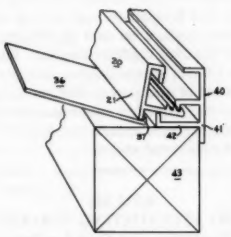
Philip N. Miller, 86 Litten Rd., Howick, Auckland, New Zealand

Continuation of Ser. No. 419,311, Sep. 17, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 621,873

Claims priority, application New Zealand, Oct. 6, 1981, 198562

Int. Cl.³ E04C *2/38*; B32B *3/06*

U.S. Cl. 428—99 **1 Claim**



1. A glazing trim having a pair of elongate cooperative members, each said member having, in cross section, two limbs substantially at right angles to each other, and engaging means comprising a plurality of teeth on one surface of one of said limbs adapted to interengage at least one tooth on a corresponding limb of said other member, whereby said members can be connected together at different spacings to accommodate sheets of material of different thicknesses therebetween, each of said members having a re-entrant flange on the other said limb which engages a respective resilient member in use

between the flange and window pane, wherein the members, once connected together, can be disconnected by removing at least one of said resilient members and tilting said pair of elongate cooperable members relative to each other in a direction such that said re-entrant flanges move toward each other, thereby to disengage said engaging means, one of said pair of elongate cooperable members having thereon a base flange disposed on the side of said one limb that is opposite said re-entrant flange on said one elongate member, said base flange having an upstanding flange that contacts said one limb on the other said elongate cooperable member to limit tilting movement of said elongate cooperable members in a direction such that said re-entrant flanges move away from each other thereby to retain said resilient members and said window pane firmly held between said re-entrant flanges.

4,539,244

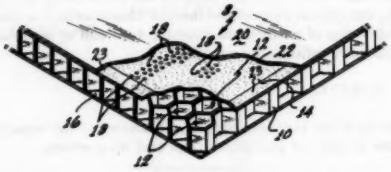
HONEYCOMB NOISE ATTENUATION STRUCTURE

Stanley L. Beggs, Chula Vista; Frank J. Riel, San Diego, and Dale W. R. Lawson, Bonita, all of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Continuation of Ser. No. 64,000, Aug. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 604,200, Aug. 13, 1975, abandoned. This application Feb. 29, 1984, Ser. No. 583,295

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—116 **18 Claims**



1. The honeycomb sandwiched attentuation panel for use adjacent a high velocity gas flow area comprising:

(a) a honeycomb core having a multiplicity of cells defined by substantially parallel walls of thin sheet material and having a pair of core faces;

(b) a perforated facing sheet of end sheet material having on a surface thereat bonded to one said core face;

(c) an imperforate facing sheet of thin sheet material bonded to the other said core face;

(d) a thin sheet of porous fibrous material; and

(e) an electrically insulating bonding medium isolating said thin sheet of porous fibrous material from said perforated facing sheet and bonded to said porous fibrous material and the other surface of said perforated facing sheet, wherein the bonding medium insulates said thin sheet of said porous fibrous material from said perforated facing sheet, the pores of said porous fibrous material providing a predetermined impeded communication between the core cells and the atmosphere through the open perforations of said perforated sheet.

4,539,245

SOUND ATTENUATING STRUCTURE

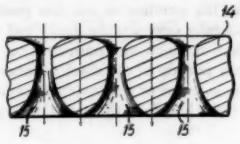
Sohan L. Sarin, Hoofddorp, and Teun Zandbergen, Emmeloord, both of Netherlands, assignors to Fokker B.V., Schiphol, Netherlands

Filed Apr. 24, 1984, Ser. No. 603,500

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—116 **5 Claims**

1. Sound attenuating structure including a core layer comprising hoenycomb shaped cells directed perpendicular to the main surface of the structure, a closed sheet at one side of said core layer and a perforated sheet at the other side of said core layer, at which side the sound waves impinge upon the structure, characterized in that the passages in said last mentioned sheet have a cross section presenting its smallest diameter somewhere within the sheet thickness of the structure and



increasing from this diameter towards both surfaces of said sheet.

4,539,246

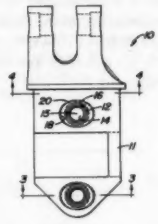
SOCKET CASTING WITH A CAST-IN BALL AND METHOD OF CASTING

Donald K. Landphair, Bettendorf, Iowa, and James P. Doering, Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Mar. 23, 1984, Ser. No. 592,522

Int. Cl.³ B22B *3/10;* **B32D** *19/00*

U.S. Cl. 428—131 **18 Claims**



1. A method of forming a socket casting with a cast-in ball having a central opening formed therethrough, said method comprising the steps of:

preparing a core assembly including a spherical ball having a central opening formed therethrough;

positioning the core assembly within a casting mold such that a casting cavity is formed, said casting cavity defining an annular ring having an inside race surface defined by the portion of the circumference of said ball surface intermediate the central opening and perpendicular to the axis of the opening; and

charging molten material into the casting cavity to form said annular ring of cast material, whereby the spherical ball is rotatably attached within the annular ring such that the ball is free to rotate about its center in any direction.

4,539,247

CONSTRUCTIONAL UNIT

Hans Andersson, Södra Rundvägen 46, 269 00 Bastad, Sweden

Filed Dec. 29, 1983, Ser. No. 566,604

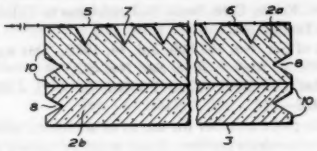
Claims priority, application Sweden, Jan. 11, 1983, 8300092

Int. Cl.³ E04C *2/26;* **B32B** *3/24, 3/30*

U.S. Cl. 428—138 **7 Claims**

1. A constructional unit applicable to a wall comprising a board including a layer of insulating material having inner and outer surfaces, a wire net attached to said layer at said outer surface, said layer being provided at said outer surface with V-shaped recesses extending in spaced relation in rows at right angles to one another to intersect and form a waffle pattern with elevated portions of truncated pyramidal shape distributed within the intersecting recesses such that plaster applied

to said outer surface of said layer becomes anchored to said layer by said wire net and said elevated portions which oppose



movement of the plaster relative to said layer and minimize cracking of the plaster.

4,539,248

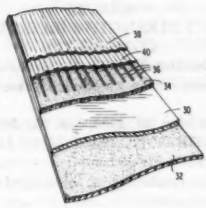
REINFORCED FILAMENT TAPE

F. Rhett Brockington, and William Z. Foster, both of Richland County, S.C., assignors to Anchor Continental, Richland, S.C.

Filed Sep. 18, 1984, Ser. No. 651,863

Int. Cl.³ B32B *5/02, 27/04*

U.S. Cl. 428—161 **17 Claims**



1. A reinforced filament tape comprising:

an elongate flexible backing ribbon having first and second mutually parallel planar surfaces;

an adhesive layer overlaying and co-extensive with said first planar surface;

a binding layer overlaying and co-extensive with said second planar surface;

a plurality of spaced mutually parallel reinforcing fiber filaments overlaying said binding layer, said fiber filaments being contacted and penetrated with a filament coating to prevent said fiber filaments from separating from said binding layer; and

a releasing layer overlaying and contoured to the shape of said filaments for facilitating unreeling of said reinforced filament tape.

4,539,249

METHOD AND APPARATUS FOR PRODUCING BLENDS OF RESINOUS, THERMOPLASTIC FIBER, AND LAMINATED STRUCTURES PRODUCED THEREFROM

Frederick H. Curzio, Garden Grove, Calif., assignor to Textile Products, Incorporated, Anaheim, Calif.

Filed Sep. 6, 1983, Ser. No. 529,514

Int. Cl.³ B32B *1/00, 3/00*

U.S. Cl. 428—175 **24 Claims**

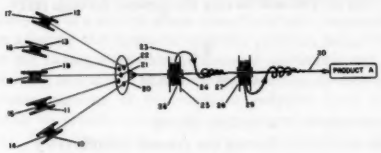
1. A process for producing laminates from graphite fibers, and the like, and a plurality of resinous thermoplastic fibers, comprising:

(a) combining or blending the graphite and thermoplastic fibers into yarn;

(b) controlling the graphite/resin weight ratio during the blending step;

(c) weaving the yarn into a flexible, dry fabric adapted for dry storage without refrigeration in which adjacent thermoplastic fibers or yarn, and graphite fibers, and the like, are adapted for sufficient movement relative to each other, thereby enabling the fabric to be conformed to a mold or substrate, the yarn and fibers having a controlled alignment in the fabric due to weaving or blending;

(d) shaping the fabric in a dry, solvent-free form by conforming the fabric onto said mold or substrate; and,



(e) heating the fabric under pressure to melt the resin and produce a shaped, graphite-resin laminate in which the graphite and resin are intimately combined in the laminate at the controlled graphite/resin ratio to produce uniform characteristics.

4,539,250

RESIST MATERIAL AND PROCESS FOR FORMING FINE RESIST PATTERN

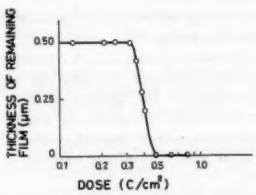
Tsuneo Fujii, Suita; Hiroshi Inukai, Takatsuki; Takayuki Deguchi, Ibaraki; Toshihiko Amano, Settsu; Masami Kakuchi, Katsuta; Hiroshi Asakawa, and Osamu Kogure, both of Mito, all of Japan, assignors to Daikin Kogyo Co. Ltd., Osaka and Nippon Telegraph & Telephone Public Corporation, Tokyo, both of, Japan

Filed Dec. 17, 1982, Ser. No. 450,726

Claims priority, application Japan, Dec. 19, 1981, 56-205876; Dec. 19, 1981, 56-205877; Dec. 26, 1981, 56-212729; Dec. 26, 1981, 56-212730

Int. Cl.³ C08F *220/22;* **B05D** *3/06*

U.S. Cl. 428—195 **4 Claims**

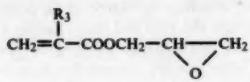


1. A resist material coated on a substrate, wherein portions of the material are irradiated and developed to form a pattern, which comprises a copolymer of a fluoroalkyl acrylate having the general formula (I):

$$CH_2=\underset{\displaystyle R_1}{\underset{|}{C}}-COO-R_2-R_f \qquad (I)$$

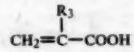
wherein R_1 is methyl group, ethyl group, a halogen-substituted methyl or ethyl group, a halogen atom or hydrogen atom, R_2 is a bivalent hydrocarbon group having 1 to 6 carbon atoms, and R_f is a fluoroalkyl group having 1 to 15 carbon atoms,

and an acrylic comonomer selected from the group consisting of a glycidyl acrylate having the general formula (II):



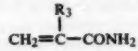
(II)

wherein R_3 is hydrogen atom, methyl group or ethyl group, an acrylic acid having the general formula (III):



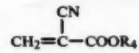
(III)

wherein R_3 is as defined above,
an acrylamide having the general formula (IV):



(IV)

wherein R_3 is as defined above,
and an α-cyanoacrylate having the general formula (V):



(V)

wherein R_4 is hydrogen atom or alkyl group having 1 to 5 carbon atoms and wherein the ratio of the fluoroalkyl acrylate (I) to the acrylic comonomer is from 60:40 to 99.9:0.1 by mole.

4,539,251

SURFACE COATED SIALON-BASE CERAMIC MATERIALS FOR TOOLS

Taijiro Sugisawa, and Teruyoshi Tanase, both of Tokyo, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1984, Ser. No. 622,221
Claims priority, application Japan, Jun. 30, 1983, 58-118831
Int. Cl.³ B32B *15/04, 9/04*
U.S. Cl. 428—216 **19 Claims**

1. A surface coated sialon-base ceramic material for wear resistant tools, comprising:

a sialon-base ceramic matrix which consists essentially of

(a) 3–30 percent by volume of at least one selected from the group consisting of the carbide of each of the metals exclusive of Cr in the groups 4a, 5a, and 6a of the periodic table of elements, nitride thereof, oxide thereof, and solid solution of at least two of said carbide, said nitride, and said oxide;

(b) 1–20 percent by volume at least one combined phase-forming component selected from the group consisting of the oxide of Li, Na, Ca, Mg, Y, any rare earth element, Si, and Al, and nitride thereof; and

(c) the balance of β-sialon expressed by the chemical formula $Si_{6-z}Al_zO_zN_{8-z}$, z being larger than 0 but not more than 4.3, and α-sialon expressed by the chemical formula $M_x(Si,Al)_{12}(O,N)_{16}$, x being larger than 0 but not more than 2, M representing at least one selected from the group consisting of Li, Na, Ca, Mg, Y, and any rare earth element, and inevitable impurities, wherein the ratio of the α-sialon/β-sialon is within a range from 5/95 to 95/5 in volume; and

at least one hard first coating layer formed on a surface of said matrix, said at least one hard coating layer being formed of at least one selected from the group consisting of carbide of Ti, Zr, and Hf, nitride thereof, carbo-nitride thereof, carbo-oxide thereof, and carbo-nitro-oxide thereof.

4,539,252

VARIABLE DENSITY BOARD HAVING IMPROVED THERMAL AND ACOUSTICAL PROPERTIES AND METHOD AND APPARATUS FOR PRODUCING SAME

Edward W. Franz, Colts Neck, N.J., assignor to Celotex Corporation, Tampa, Fla.

Division of Ser. No. 167,800, Jul. 14, 1980,. This application May 9, 1983, Ser. No. 492,714
Int. Cl.³ C04B *43/02;* **E04B** *1/76, 1/82, 1/88*
U.S. Cl. 428—218 **7 Claims**

1. A one-piece member for use as an acoustical and/or thermal barrier, a major portion of said member having a substantially uniform thickness measured across the major surfaces thereof;

said member being comprised of fibers set in a binder;

the density of said member varying across the thickness thereof whereby the density of said member gradually decreases from the major surfaces toward the intermediate portion thereof.

4,539,253

HIGH IMPACT STRENGTH FIBER RESIN MATRIX COMPOSITES

Kevin R. Hirschbuehler, Bel Air, and Bruce A. Stern, Fallston, both of Md., assignors to American Cyanamid Co., Stamford, Conn.

Filed Mar. 30, 1984, Ser. No. 595,314
Int. Cl.³ B32B *27/08, 27/30, 27/38, 31/08, 31/12*
U.S. Cl. 428—229 **29 Claims**

1. A method for producing an interleafed fiber resin matrix prepreg fabric comprising

(1) incorporating a non-woven or woven fibrous mat or carrier of lightweight supporting filaments into an interleaf resin composition comprising

(a) a first thermosetting epoxy resin composition containing

(b) about 8% to 70% by weight of a rubbery vinyl addition polymer to provide a supported interleaf resin layer; and

(2) introducing said supported interleaf resin layer to at least one surface of a fiber resin matrix comprising

(a) a fabric of high-strength reinforcing filaments and

(b) a second thermosetting epoxy resin composition coating and impregnating said fabric.

16. An interleafed fiber resin matrix prepreg fabric comprising

(A) a fiber resin matrix comprising

(i) 40% to 70% by weight high-strength filaments interwoven to form a reinforcing fabric, and

(ii) 30% to 60% by weight of a first thermosetting epoxy resin composition coating said fabric, said first epoxy resin composition comprising (a) a polyepoxide compound or combination of polyepoxide compounds, and (b) a curing agent effective to catalyze polymerization of said polyepoxide compound; and

(B) a discrete interleaf resin layer comprising

(i) a non-woven or woven fibrous mat or carrier of lightweight supporting filaments, and

(ii) a second thermosetting epoxy resin composition coating said non-woven or woven fibrous mat or carrier, said second epoxy resin composition comprising (a) a polyepoxide compound or a combination of polyepoxide compounds, (b) about 8% to 70% by weight of a rubbery vinyl addition polymer, and (c) a curing agent affective to catalyze polymerization of said polyepoxide compound.

4,539,254

REINFORCING COMPOSITE FOR ROOFING MEMBRANES AND PROCESS FOR MAKING SUCH COMPOSITES

Terry J. O'Connor, and Ian G. Cooper, both of St. Catharines, Canada, assignors to Bay Mills Limited, St. Catharines, Canada

Continuation-in-part of Ser. No. 444,215, Nov. 24, 1982, Pat. No. 4,491,617. This application Dec. 20, 1984, Ser. No. 684,116

Int. Cl.[3] B32B *5/06*

U.S. Cl. 428—236 9 Claims

1. A composite for reinforcing roofing membranes comprising three or more layers bonded together with a thermosetting resin one of which layers is made of fiberglass, one of which is made of polyester, and the third of which is made of either polyester or fiberglass; further, at least one of which is in the form of a scrim, one of which is in the form of a mat, and a third of which is in the form of a mat or a scrim; wherein the composite is flexible, capable of being impregnated by a bitumenous material, and has sufficient strength to be useful in reinforcing membrances.

4,539,255

MOISTURE-PERMEABLE WATERPROOF FABRIC

Keishi Sato, Suita; Takeshi Nishida, Ibaragi; Toji Kamiya, Takatsuki, and Yutaka Tanaka, Osaka, all of Japan, assignors to Kanebo Ltd., Tokyo, Japan

Filed Sep. 16, 1983, Ser. No. 532,954

Claims priority, application Japan, Sep. 17, 1982, 57-162995

Int. Cl.[3] B32B *5/18, 5/32, 7/02, 27/40*

U.S. Cl. 428—252 7 Claims

1. A moisture-permeable waterproof fabric having a water resistance measured by JIS D-1092 of more than 2000 mm and a moisture-permeability measured by JIS K-6328 of at least 800 $g/m^2 \cdot 24$ hr, which comprises a polyamino acid modified polyurethane film having a thickness of 2 to 20 microns and a fabric bonded on said polyurethane film by a polyurethane adhesive in an amount of at least 10 g/m^2, the polyamino acid modification ratio of said polyurethane film being within the range of 2 to 20% and the total amount of said adhesive and said polyurethane film being not more than 50 g/m^2.

4,539,256

MICROPOROUS SHEET MATERIAL, METHOD OF MAKING AND ARTICLES MADE THEREWITH

Gene H. Shipman, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation-in-part of Ser. No. 416,140, Sep. 9, 1982, abandoned. This application Feb. 28, 1984, Ser. No. 583,288

Int. Cl.[3] B29D *27/04;* B32B *3/10*

U.S. Cl. 428—315.5 29 Claims

1. A method of making a microporous article, comprising:

(a) melt blending to form a solution comprising 30 to 80 parts by weight of crystallizable thermoplastic polymer with 70 to 20 parts by weight of a compound with which said thermoplastic polymer is miscible and in which said thermoplastic polymer will dissolve at the melting temperature of said thermoplastic polymer but which will phase separate on cooling to a temperature at or below the crystallization temperature of said thermoplastic polymer;

(b) forming a shaped article of the melt blended solution;

(c) cooling said shaped article to a temperature at which said thermoplastic polymer crystallizes to cause phase separation to occur between said compound and said polymer thereby to provide an article comprising an aggregate of a first phase comprising particles of crystallized thermoplastic polymer in a second phase comprising said compound with adjacent thermoplastic polymer particles being distinct but having a plurality of zones of continuity; and

(d) orienting said article at least in one direction to separate adjacent particles of thermoplastic polymer from one another to provide a network of interconnected micropores therebetween and to permanently attenuate the thermoplastic polymeric material in said zones of continuity to form fibrils.

4,539,257

MAGNETIC RECORDING MEDIUM HAVING IMPROVED RUNNING PROPERTIES

Katsumi Ryoke; Kenichi Masuyama; Takashi Yoneyama; Norio Nasu, and Eiichi Tadokoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 13, 1984, Ser. No. 599,917

Claims priority, application Japan, Apr. 13, 1983, 58-65046

Int. Cl.[3] G11B *5/70*

U.S. Cl. 428—323 20 Claims

1. A magnetic recording medium, comprising:

a non-magnetic support base having provided thereon;

a magnetic layer comprised of ferromagnetic particles dispersed in a binder along with carbon black particles having an average primary particle size in the range 30 mμ to 50 mμ, the carbon black being capable of the adsorption of 120 ml or more of dibutyl phthalate per 100 g of carbon black.

4,539,258

SUBSTRATE COATED WITH OPALESCENT COATING AND METHOD OF COATING

Sol Panush, Farmington Hills, Mich., assignor to Inmont Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 633,755, Jul. 23, 1984, abandoned. This application Jan. 14, 1985, Ser. No. 691,099

Int. Cl.[3] B32B *5/16, 19/00*

U.S. Cl. 428—324 8 Claims

1. A substrate material coated with at least three layers of a decorative, protective coating comprising a nonmetallic, primary base color coat having an N-4 to N-8 value on the Munsell color chart, a transparent interference coat comprising a polymeric binder containing metal oxide encapsulated mica in a pigment to binder ratio of 0.06 to 0.13 on the color coat, and a transparent protective polymeric clear coat on the transparent interference coat, the coating producing an opalescent color effect on the substrate material.

4,539,259

LAMINATE FOR MAKING TUBES

Edward J. Zuscik, Oakland, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

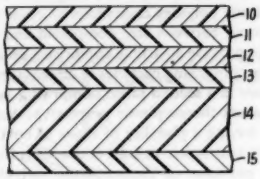
Filed Jul. 2, 1984, Ser. No. 627,172

Int. Cl.[3] B65D *35/08;* B32B *15/08, 27/08*

U.S. Cl. 428—332 7 Claims

1. In a laminate suitable for forming a tube used to dispense a substance packaged therein, the laminate comprising a heat sealable polymeric layer, a first adhesive layer, a layer of metal

foil, a second adhesive layer, a layer providing stiffness and deadfold properties, and an outer polymeric layer, the improvement wherein the layer providing stiffness and deadfold properties is a layer of high density polyethylene.



4,539,260

MAGNETIC RECORDING MATERIAL

Koichi Abe, Kyoto; Kenichi Kawakami; Toshiya Yoshii, both of Ohtsu, and Toshihide Inoue, Ichinomiya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

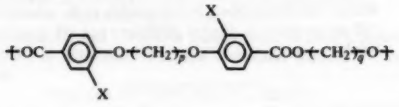
Filed Aug. 26, 1983, Ser. No. 526,773

Claims priority, application Japan, Aug. 26, 1982, 57-148102; Aug. 26, 1982, 57-148103; Oct. 22, 1982, 57-184744

Int. Cl.³ B32B *5/00*

U.S. Cl. 428—336 **18 Claims**

1. A magnetic recording material which comprises a film of a polyester and a magnetic layer formed on at least one side of said film, said polyester comprising more than 85 mol % of a main repeating unit represented by the formula:



where

X is a halogen atom selected from the group consisting of fluorine, chlorine and bormine; p is an integer of 2 to 6, and q is an integer of 2 to 4,

and having an intrinsic viscosity of 0.3 to 1.4, and said film having a refractive index ratio of 0.935 to 0.975 in the thickness direction and a density index of 0.02 to 0.08.

4,539,261

PROCESS FOR PRODUCING MAGNETIC POWDER AND PRODUCT

Kazuo Nakata; Masatsuyo Maruo, and Kiyoshi Asano, all of Moriyama, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Apr. 5, 1983, Ser. No. 482,225

Claims priority, application Japan, Sep. 16, 1982, 57-161335; Oct. 6, 1982, 57-175745; Feb. 10, 1983, 58-21282

Int. Cl.³ B32B *3/16*

U.S. Cl. 428—403 **21 Claims**

1. A process for producing a magnetic powder which comprises the two steps of first coating the particle surfaces of a magnetic iron oxide with a cobalt compound or a cobalt compound and a ferrous compound and subsequently coating the cobalt compound or cobalt and ferrous compounds-coated surfaces with a compound of at least one metal selected from the group consisting of manganese, vanadium and zinc under a non-oxidizing atmosphere.

16. A product obtained by the process of claim 1.

4,539,262

INSULATING MATERIAL

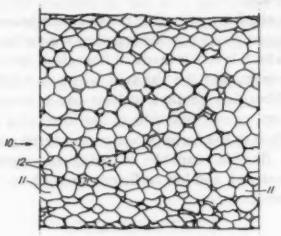
John Hurst, London, England, assignor to W. R. Grace Limited, London, England

Filed Jan. 20, 1983, Ser. No. 459,546

Claims priority, application United Kingdom, Feb. 9, 1982, 8203674

Int. Cl.³ B05D *7/00*; B32B *5/16, 9/00, 11/00*

U.S. Cl. 428—407 **22 Claims**



1. An insulating material comprising expanded plastics beads which are each encapsulated in bitumen or a bituminous compound which has a softening point more than 10° C. higher than the melting point of the beads and is free from solvents, light oils, emulsifiers or other liquifying agents, such encapsulation having been formed with the bitumen or bituminous compound in liquid form in a hot process, the beads having been expanded prior to processing with the bitumen or bituminous compound.

4,539,263

BLENDS OF IONOMER WITH PROPYLENE COPOLYMER AND ARTICLES

George L. Hoh, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 525,505, Aug. 22, 1983,. This application May 23, 1984, Ser. No. 613,375

Int. Cl.³ C08L *23/16, 23/26, 23/08*; B32B *27/28*

U.S. Cl. 428—500 **4 Claims**

1. Coextrusions for producing film characterized by a nearly constant peel strength over an extended heat seal temperature range, made from a molecular blend of polymeric materials comprising:

(a) 80–93 weight percent of an ethylene/acid ionomer, and

(b) 7–20 weight percent of a propylene/α-olefin copolymer, wherein the α-olefin comprises 1–12 weight percent of the copolymer, and wherein said coextrusion further comprises at least one extrudable material other than said molecular blend.

4,539,264

MAGNETIC RECORDING MEDIUM

Kenji Yazawa, and Kenichi Baba, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 6, 1983, Ser. No. 539,654

Claims priority, application Japan, Oct. 12, 1982, 57-178749

Int. Cl.³ G11B *5/66*

U.S. Cl. 428—621 **7 Claims**

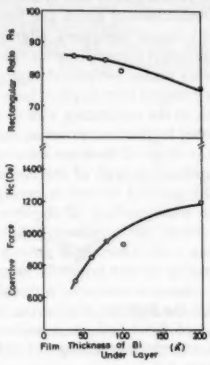
1. A magnetic recording medium comprising:

a non-magnetic substrate;

a first layer made of bismuth formed on said substrate, said first layer having a thickness less than 100 Å; and

a ferromagnetic metal layer of Co or Co-Ni alloy formed

over said first layer without further physical treatment of said first layer, said magnetic recording medium having



isotropic magnetic characteristics on a major surface of said magnetic recording medium.

4,539,265

MAGNETIC RECORDING MEDIUM

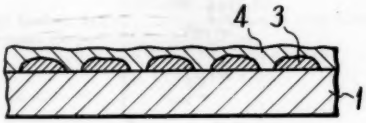
Kenji Yazawa, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 367,949, Apr. 13, 1982, abandoned. This application Oct. 11, 1983, Ser. No. 540,707

Claims priority, application Japan, Apr. 14, 1981, 56-56042; May 29, 1981, 56-83031

Int. Cl.³ G11B *5/66*

U.S. Cl. 428—621 **6 Claims**



1. A magnetic recording medium comprising:

a non-magnetic substrate;

a first layer made of bismuth having a thickness of from 10 to 1000 Angstroms formed on said substrate in a discontinuous island shape; and

a ferromagnetic metal layer having a thickness of from 100 to 1000 Angstroms formed over said first layer and said substrate, said medium having isotropic magnetic characteristics in the plane of the ferromagnetic metal layer.

4,539,266

MAGNETIC RECORDING MEDIUM

Takahiro Miyazaki, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,729

Claims priority, application Japan, Nov. 30, 1983, 58-226000

Int. Cl.³ G11B *5/72*

U.S. Cl. 428—695 **10 Claims**

1. A magnetic recording medium comprising a non-magnetic base and a magnetic layer provided on one surface of said non-magnetic base, in which said magnetic recording medium is provided with a layer containing a fatty acid ester with diglycerol.

4,539,267

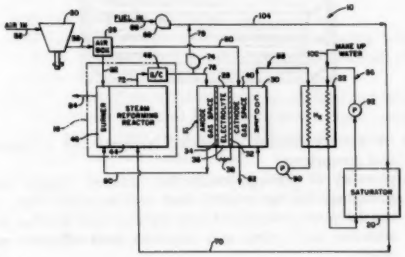
PROCESS FOR GENERATING STEAM IN A FUEL CELL POWERPLANT

Richard A. Sederquist, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1984, Ser. No. 678,606

Int. Cl.³ H01M *8/06*

U.S. Cl. 429—17 **2 Claims**



1. In a process for operating a fuel cell powerplant, the powerplant comprising a steam reforming reactor, a saturator, and a fuel cell stack including anode gas compartments and cathode gas compartments, the steps of:

(a) introducing a stream comprising a hydrocarbon fuel and steam into the steam reforming reactor and reforming the fuel therein to produce hydrogen, the gas stream including substantially all the steam necessary for the step of reforming;

(b) directing hydrogen produced in the reactor into and through the anode gas compartments of the stack;

(c) directing an oxygen containing gas into and through the cathode gas compartments of the stack;

(d) electrochemically reacting the hydrogen and oxygen within the stack to produce electricity, heat and water;

(e) continuously circulating a mass of liquid water, in a loop, at a pressure at least as great as the operating pressure in the steam reforming reactor, wherein the water is alternately reduced in temperature and then reheated on each pass through the loop, the step of reheating including reheating said water as it circulates to a temperature below its boiling point using only the heat generated in said fuel cell stack by passing said liquid water in indirect heat exchange relationship with said stack, said step of reducing the water temperature including passing said heated water through said saturator;

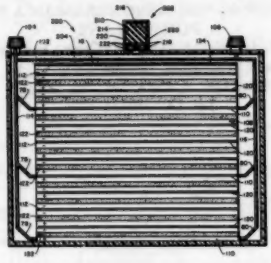
(f) passing the stream of hydrocarbon fuel, prior to its being introduced into the reactor in step (a), through the saturator simultaneously with said heated water and in direct contact with the heated water, and adding steam to the hydrocarbon fuel as it passes through the saturator by evaporating some of the heated water into the fuel stream, the heat of vaporization being provided by the heat in the water passing through the saturator, whereby said water drops in temperature as it passes therethrough, the amount of steam in the fuel stream leaving the saturator being substantially all the steam required in the step of reforming the fuel; and

(g) adding water to the water circulating in the loop to replenish the water evaporated therefrom in the saturator.

4,539,268
SEALED BIPOLAR MULTI-CELL BATTERY

John J. Rowlette, Monrovia, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 279,841, Jul. 2, 1981, abandoned. This application Jun. 17, 1983, Ser. No. 505,393
Int. Cl.³ H01M 2/12, 2/28
U.S. Cl. 429—54 18 Claims



1. A battery having a positive terminal and a negative terminal comprising:

a plurality of through-conductive, stacked, bipolar plate groupings having positive ends and negative ends, said bipolar plate groupings being stacked with positive ends adjacent each other and negative ends adjacent each other;

a positive conductive, electrolyte-impermeable monoplate located between adjacent negative plate grouping ends having positive active material on both sides facing said negative plate grouping ends and being separated from said negative plate grouping ends on both sides by an electrolyte layer confined and contained within an acid-resistant mat;

a negative conductive, electrolyte-impermeable monoplate located between adjacent positive plate grouping ends having negative active material on both sides facing said positive plate grouping ends and being separated from said positive plate grouping ends on both sides by an electrolyte layer confined and contained within an acid-resistant mat;

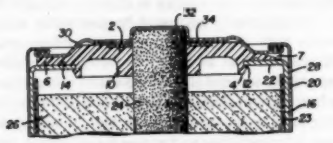
means for connecting said positive monoplates to said positive battery terminal; and

means for connecting said negative monoplates to said negative battery terminal whereby each of said bipolar plate groupings is connected in electrical energy communication with said terminals.

4,539,269
LOW PROFILE SEAL

Manuel R. Malay, Brunswick, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 511,910, Jul. 8, 1984, abandoned. This application Dec. 20, 1984, Ser. No. 683,958
Int. Cl.³ H01M 2/12
U.S. Cl. 429—54 6 Claims

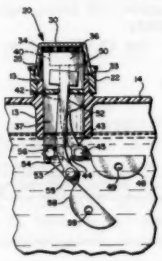


1. A galvanic cell comprising a cylindrical container having a closed end, an open end and an upstanding wall with an inwardly turned peripheral edge portion, said edge portion having an inner surface and an outer surface, said container including therein electrochemically active ingredients; and a closure member disposed over the open end of said container, said closure member comprising a resilient annular flange extending toward the closed end of said container, said flange defining an outer circumferential notch and being positioned such that the inwardly turned peripheral edge portion of the container is inserted into said circumferential notch; characterized in that the inwardly turned peripheral edge portion of the container is inwardly crimped at an angle of between about 85° and about 95° relative to the upstanding wall of the container, and said closure member further comprises an outer sealing lip which is disposed at an angle of between about 85° and about 95° relative to the upstanding wall of the container, said lip extending substantially parallel to and in contiguous sealing relationship with the outer surface of the inwardly turned peripheral edge portion of the container, said lip having an inner face and defining a circumferential groove in said inner face, such that the sealing lip and inwardly turned peripheral edge portion of the container comprise a resealable venting means operable in that the buildup of pressure inside the cell beyond a predetermined limit will cause said sealing lip to momentarily deflect, thereby permitting the release of such pressure from inside the cell.

4,539,270
BATTERY CAP INDICATOR WITH LEVERED FLOAT

Santiago Mejia, 525 N. Ocean Blvd. #1024, Pompano Beach, Fla. 33062

Filed Dec. 20, 1983, Ser. No. 563,367
Int. Cl.³ H01M 10/48; G01F 23/06
U.S. Cl. 429—91 10 Claims



1. A battery cap indicator assembly, comprising:

(a) a battery cap adapted to be connected to a battery casing top to cover over an electrolyte access opening and which has a lower interior portion which extends downwardly through the access opening,

(b) the cap having a hollow upstanding transparent battery top which permits visual inspection of the interior of the cap,

(c) an indicator flag disposed within the battery cap and which moves upwardly and downwardly depending upon the condition of the electrolyte,

(d) indicator flag support means connected to the lower portion of the cap and to the indicator flag for supporting and moving the indicator flag when there are changes in the state of the electrolyte,

(e) a second indicator flag is disposed within the battery top and which moves upwardly and downwardly depending upon the condition of the electrolyte,

(f) a second flag support means is connected to the lower portion of the cap and to the flag for supporting and moving the flag when there are changes in the state of the electrolyte,

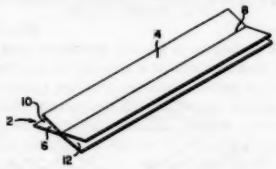
(g) the second indicator flag and flag support means being sensitive to, and indicating changes in, density of the electrolyte, and

(h) the other indicator flag and flag support means being sensitive to, and indicating changes in, electrolyte level.

4,539,271
GALVANIC CELL HAVING A COILED ELECTRODE ASSEMBLY

Grace Y. Crabtree, Cleveland, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 30, 1984, Ser. No. 595,367
Int. Cl.[3] H01M 4/00
U.S. Cl. 429—94 9 Claims

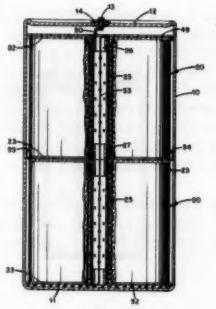


1. A galvanic cell comprising a coiled electrode assembly comprising a separator assembly having a first pocket formed by a first strip of separator material superimposed over a second strip of separator material and each separator material having an adherable edge, and a second pocket formed by a first strip of separator material, superimposed over a second strip of separator material and each separator material having an adherable edge, said second pocket being superimposed over said first pocket such that the adherable edges of said first pocket and said second pocket are aligned with at least a portion of the adherable edges adhered to form a seam functioning as a pivot for the first pocket and second pocket; a first electrode disposed in said first pocket; and a second electrode disposed in said second pocket; said electrode assembly coiled about an axis transverse to the adhered edges such that the seam formed by the adhered edges is in a plane which is normal to the coiling axis.

4,539,272
ELECTROCHEMICAL CELL HAVING A PLURALITY OF BATTERY STACKS

Franz Goebel, Sudbury, Mass., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Dec. 7, 1983, Ser. No. 559,059
Int. Cl.[3] H01M 6/10
U.S. Cl. 429—94 12 Claims

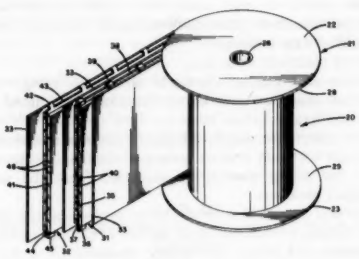


1. An electrochemical cell comprising
a housing;
an electrochemical system within the housing including an electrolytic solution and first and second battery stacks exposed to the electrolytic solution;
said first battery stack including
a spool having first and second conductive contact members with a post therebetween supporting the contact members in fixed relationship and electrically insulated from each other,
a first electrode structure,
a second electrode structure,
said first and second electrode structures being wound around said post and being electrically insulated from each other,
said first electrode structure being in physical and electrical contact with said first conductive contact member and being electrically insulated from said second conductive contact member, and
said second electrode structure being in physical and electrical contact with said second conductive contact member and being electrically insulated from said first conductive contact member;
said second battery stack including
a spool having first and second conductive contact members with a post therebetween supporting the contact members in fixed relationship and electrically insulated from each other,
a first electrode structure,
a second electrode structure,
said first and second electrode structures being wound about said post and being electrically insulated from each other,
said first electrode structure being in physical and electrical contact with said first conductive contact member and being electrically insulated from said second conductive contact member, and
said second electrode structure being in physical and electrical contact with said second conductive contact member and being electrically insulated from said first conductive contact member.

4,539,273
ELECTRODE STRUCTURE FOR ELECTROCHEMICAL CELL

Franz Goebel, Sudbury, Mass., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Dec. 7, 1983, Ser. No. 559,060
The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.
Int. Cl.[3] H01M 6/10
U.S. Cl. 429—94 11 Claims



1. An electrode structure adapted for use in a battery stack of an electrochemical cell employing a spool having first and second conductive contact members with a post therebetween supporting the contact members in fixed relationship and electrically insulated from each other; the electrode structure comprising
an elongated substrate of thin, solid, metal having one edge and an opposite edge along its length;
electrode material adherent to the substrate; and
a plurality of deflective, resilient contact elements spaced along said one edge of the substrate;
said opposite edge of said elongated substrate being protected by insulating material positioned at said opposite edge to prevent electrical contact with said other of said contact members;

said electrode structure being adapted to be wound around said post with said contact elements bearing against one of said conductive contact members to provide physical and electrical contact therewith and urging said insulating material against the other of said conductive contact members.

4,539,274

ELECTROCHEMICAL CELL HAVING WOUND ELECTRODE STRUCTURES

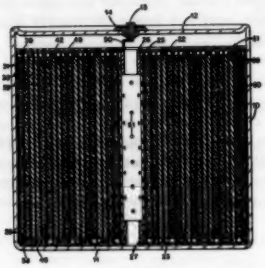
Franz Goebel, Sudbury, Mass., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Dec. 7, 1983, Ser. No. 559,061

The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

Int. Cl.³ H01M 6/10

U.S. Cl. 429—94 **13 Claims**



1. An electrochemical cell comprising

a housing;

a battery stack within said housing including

a first contact member of conductive material having a contact surface;

a second contact member of conductive material having a contact surface;

a post extending between said first and second contact members supporting said contact members in fixed relationship with respect to each other with said first and second contact members electrically insulated from each other;

a first electrode structure;

a second electrode structure;

said first and second electrode structures being wound around said post and being electrically insulated from each other;

said first electrode structure being in physical and electrical contact with said contact surface of the first contact member and being electrically insulated from the second contact member;

said second electrode structure being in physical and electrical contact with said contact surface of the second contact member and being electrically insulated from the first contact member;

an electrolyte within said housing in contact with the first and second electrode structures; and

first and second terminal means connected to the first and second contact members, respectively.

4,539,275

LAMINAR BATTERIES AND METHODS OF MAKING THE SAME

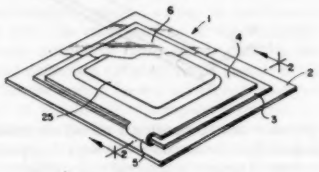
Paul A. Plasse, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 24, 1981, Ser. No. 295,269

Int. Cl.³ H01M 6/46

U.S. Cl. 429—152 **8 Claims**

1. In a laminar battery, a conductive metal sheet forming an externally accessible collector terminal of the battery; a frame of thermoplastic liquid impermeable electrical insulating material formed with a central aperture, said frame being laminated around its periphery to said metal terminal sheet; an electrode assembly comprising a sheet of conductive plastic uniformly coated on one side with active electrode particles in a binder, said conductive plastic sheet being laminated around its periphery to a region of a side of said frame opposite the side laminated to said metal terminal sheet, said conductive plastic sheet having a central region extending through the aperture in



said frame and being laminated to said metal terminal in the region within said aperture; a sheet of separator material overlying said electrode particle coating on said conductive plastic sheet and having borders extending beyond the borders of said conductive plastic sheet and terminating within the borders of said frame, and means adhering said separator sheet to said frame in discontinuous regions about the periphery of said separator sheet to provide intermediate passages of gas flow between the regions of adherences.

4,539,276

SOLID ELECTROLYTE

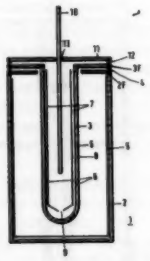
Friedrich Harbach, Heidelberg, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,873

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247967

Int. Cl.³ H01M 6/18

U.S. Cl. 429—191 **10 Claims**



1. A solid electrolyte ceramic having a composition according to the general formula:

$$A_{1+z1+2z2}M^{I}_{z2}M^{II}_{z1}Al_{11-z2-z1}O_{17}$$

wherein A stands for an alkali metal, silver, hydrogen or a hydrogen-containing compound; M^{I} and M^{II} are elements which furnish mono or bivalent ions; z_1 and z_2 each have a value of 0 to 1 with the proviso that the sum of z_1+2z_2 is between 0.4 and 0.9 and wherein the composition consists of a fully stabilized β''—Al_2O_3 as determined by X-ray diffraction.

4,539,277

ION EXCHANGE MEMBRANE AND PROCESS FOR PRODUCING THE SAME

Isao Ishigaki, Maebashi; Takanobu Sugo, Gunma, and Jiro Okamoto, Takasaki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 290,302, Aug. 5, 1981, abandoned. This application Nov. 15, 1983, Ser. No. 551,884
Claims priority, application Japan, Aug. 18, 1980, 55-113201
Int. Cl.³ H01M 2/16
U.S. Cl. 429—249 5 Claims

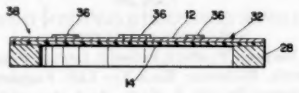
1. A separator membrane for use in secondary alkali batteries, said membrane comprising a hydrocarbon-or non-fluorine halogen-containing polymer substrate having a non-ion selective hydrophilic group and ion exchange group, said membrane having an electrical resistance which, when said membrane is heated in 12N NaOH for 30 minutes at a temperature between about 20° and 100° C., varies from the initial value for 20° C. by an amount between 10% and about 24%.

4,539,278

MASK STRUCTURE FOR X-RAY LITHOGRAPHY AND METHOD FOR MAKING SAME

Bob J. Williams, San Jose, and Daniel L. Brors, Los Altos, both of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 12, 1984, Ser. No. 588,607
Int. Cl.³ G03F 9/00
U.S. Cl. 430—5 23 Claims



1. A method for forming a mask substrate for X-ray lithography comprising the steps of:
a. forming a film of a first X-ray transparent material on a support member;
b. coating said film with a layer of a second X-ray transparent material;
c. etching away the central area of said support member, leaving a composite X-ray transparent member adhered to a first ring;
d. placing said composite member on a second ring with the first X-ray transparent material in contact therewith, said second ring having an outer diameter somewhat smaller than the inner diameter of said first ring;
e. applying a predetermined force to the edge of said composite member extending beyond the outer diameter of said second ring to put said composite member in tension;
f. while said predetermined force is being applied, adhering a third ring to said layer of said second X-ray transparent material;
g. removing the force applied in step (e); and
h. trimming away any of said composite member and said first ring extending beyond the outer diameter of said second ring.

4,539,279

IMAGE DENSITY CONTROL METHOD

Kazuo Murai, and Yutaka Hasegawa, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 7, 1983, Ser. No. 549,385
Claims priority, application Japan, Nov. 11, 1982, 57-197939
Int. Cl.³ G03G 21/00
U.S. Cl. 430—30 14 Claims

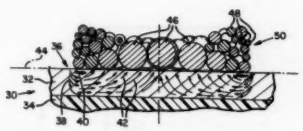
1. A method of controlling a density of an image formed by developing an electrostatic image on a photoconductive element by means of a toner, said method comprising the steps of:
(a) providing at least two regions for independent test patterns which are different from each other as latent images electrostatically formed on a photoconductive element;
(b) sensing a value relating to an image density in each of the two pattern regions;
(c) compensating the sensed value relating to the image density in each of the pattern regions when said value is out of a predetermined range; and
(d) controlling an image density parameter relating to image precessing which has influence on image density, in response to the values relating to the image densities which are representative of the two pattern regions respectively; step (c) comprising a step of (e) interrupting a control over the image density parameter.

4,539,280

METHOD FOR CREATING MAGNETIC TONER IMAGES HAVING CONTROLLED TONER DISTRIBUTION

Gilbert D. Springer, Sunnyvale, Calif., assignor to Ferix Corporation, Fremont, Calif.

Filed Feb. 21, 1984, Ser. No. 581,868
Int. Cl.³ G03G 19/00
U.S. Cl. 430—39 5 Claims



1. A method for producing a controlled-distribution, toned magnetic image unit on a planar-like magnetic-image-storage medium having a magnetizable facial expanse using magnetically attractable toner particles having differing sizes, said method comprising
creating in such a facial expanse a latent magnetic image formed of magnetic vectors extending generally parallel with the facial expanse adjacent the perimeter of the image when the same is viewed normal to the plane of the expanse, and which extend with increased angularity with respect to the facial expanse plane with distance inwardly from the image's perimeter,
positioning such image sufficiently close to a mass of such particles thereby to draw particles magnetically to the latent image, and
by said positioning and drawing, selectively capturing particles on the facial expanse extending over the latent image, with the sizes of such captured particles generally tending to increase in size with the distance inwardly from the perimeter of the image.

4,539,281

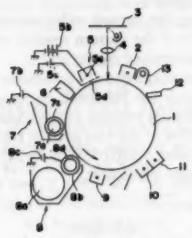
METHOD OF FORMING DICHROMATIC COPY IMAGES

Susumu Tanaka, Aichi, and Kaoru Takebe, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 30, 1983, Ser. No. 557,225
Claims priority, application Japan, Dec. 2, 1982, 57-212287
Int. Cl.³ G03G 13/01, 13/09
U.S. Cl. 430—45 6 Claims

1. A method of forming dichromatic copy images comprising a first step of forming an electrostatic latent image having a potential pattern to be developed in a first color and a potential pattern to be developed in a second color, a second step of developing said first color potential pattern by a first magnetic brush developing device using at least a magnetic toner of first color triboelectrically chargeable to a specific polarity, a third step of developing said second color potential pattern by a second magnetic brush developing device using a magnetic

carrier substantially not triboelectrically chargeable with said magnetic toner and a toner of a second color triboelectrically



chargeable to a polarity opposite to said magnetic toner by contact with the magnetic carrier, and a fourth step of transferring the developed image.

4,539,282

ELECTROPHOTOGRAPHIC PHOTOCONDUCTIVE ELEMENTS

Junichi Morimoto; Fumio Kawamura; Akira Watanabe; Yoshio Suzuki, and Masamichi Kawamura, all of Shizuoka, Japan, assignors to Tomoegawa Paper Manufacturing Company Limited, Tokyo, Japan

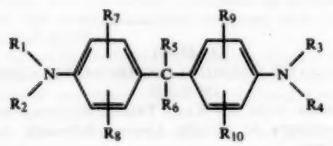
Filed Dec. 20, 1983, Ser. No. 563,437

Claims priority, application Japan, Dec. 23, 1982, 57-224894

Int. Cl.³ G03G *5/00, 5/04, 5/08*

U.S. Cl. 430—59 **9 Claims**

1. An electrophotographic photosensitive element which comprises a conductive support and at least a photosensitive layer formed on said conductive support, said photosensitive layer comprising sensitizing dye treated zinc oxide, a polycarbonate binder used in an amount ranging from 5 to 400 parts by weight per hundred parts by weight of said zinc oxide, and a compound of the general formula (I) used in an amount ranging from 5 to 500 parts by weight per hundred parts by weight of said zinc oxide,



(I)

in which R_1, R_2, R_3 and R_4 independently represent a hydrogen atom, a substituted or unsubstituted alkyl group, a cycloalkyl group, an alkenyl group, or an aryl group, R_5 and R_6 independently represent a hydrogen atom, a substituted or unsubstituted alkyl group, a cycloalkyl group, an alkenyl group, a cycloalkenyl group, or an aryl group, R_7, R_8, R_9 and R_{10} independently represent a hydrogen atom, a hydroxyl group, a substituted or unsubstituted alkyl group, a cycloalkyl group, an alkenyl group, an aryl group, an alkoxy group or an amino group, and optionally R_5 and R_6 are able to jointly form a saturated or unsaturated hydrocarbon ring having from 3 to 10 carbon atoms.

4,539,283

AMORPHOUS SILICON PHOTOCONDUCTIVE MEMBER

Shigeru Shirai, Yamato; Junichiro Kanbe, and Tadaji Fukuda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,464

Claims priority, application Japan, Jan. 16, 1981, 56-5524; Jan. 16, 1981, 56-5525; Jan. 16, 1981, 56-5526

Int. Cl.³ G03G *5/082, 5/14*

U.S. Cl. 430—61 **41 Claims**

1. A photoconductive member comprising a support for a photoconductive member and a layer which comprises an amorphous material having silicon atoms as matrix containing halogen atom in amounts from 1 to 40 atomic percent and exhibits photoconductivity, said layer having a layer region containing carbon atom in at least a part thereof, the content of the carbon atoms in said layer region being distributed unevenly in the direction of the thickness of said layer and evenly within a plane substantially parallel to the surface of the support to selectively provide enhanced photosensitization and stable image characteristics or barrier properties wherein the distribution profile of the content of carbon atoms within said layer region in the layer thickness direction has the maximum value of distribution C_{max} being 0.03 to 90 atomic %, and the total content of carbon atoms in the layer region is 0.05–30 atomic %.

4,539,284

DEVELOPER COMPOSITIONS WITH INFRARED ABSORBING ADDITIVES

Angello J. Barbetta, Penfield; Robert J. Gruber, Pittsford; Louis V. Isganitis, Rochester; Kock-Yee Law, Fairport; John W. Lin, Webster; Ronald J. Koch, Rochester, and Steven T. Dunn, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 16, 1984, Ser. No. 600,854

Int. Cl.³ G03G *9/10*

U.S. Cl. 430—110 **24 Claims**

1. An improved infrared sensitive flash fusible colored toner composition consisting essentially of (1) resin particles, (2) pigment particles selected from the group consisting of cyan, magenta, yellow, blue, red and green, and (3) additives selected from the group consisting of vanadyl phthalocyanines, naphthalocyanines, and the quaternary ammonium salts selected from the group consisting of 1,1',3,3,3',3 hexylmethyl-4,4',5,5'-dibenzo-2,2'-indotricarbocyanine perchlorate, 5,5'-dichloro-11-diphenylamine-3,3'-diethyl-10,12-ethylenethiatricarbocyanine perchlorate, 1,1',3,3,3',3'-hexamethylindotricarbocyanine perchlorate, and 3,3'-di(3-acetoxypropyl)-11-diphenylamine-10,12-ethylene-5,6,5',6'-dibenzothiatricarbocyanine perchlorate.

4,539,285

PHOTOSENSITIVE NEGATIVE DIAZO COMPOSITION WITH TWO ACRYLIC POLYMERS FOR PHOTOLITHOGRAPHY

Tulay Duyal, Manalapan, and John E. Walls, Hampton, both of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Mar. 14, 1984, Ser. No. 589,434

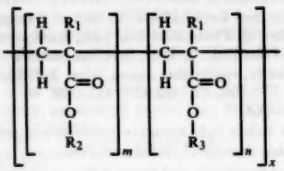
Int. Cl.³ G03C *1/60*; G03F *7/08*

U.S. Cl. 430—157 **18 Claims**

1. A photosensitive composition which comprises in admixture:

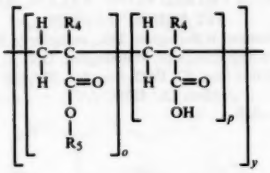
(a) from about 15% to about 45% by weight of a light sensitive, negative working diazonium salt; and

(b) from about 15% to about 45% by weight of an acrylic polymer having the formula



wherein
R_1 is H or, CH_3
R_2 is CH_3, CH_2CH_3, or $(CH_2)_3CH_3$
R_3 is CH_3, CH_2CH_3, or $(CH_2)_3CH_3$
m=1 when R_2 is equal to R_3, and
n=1 when m=1, or
m=1 to 4 when R_2 is not equal to R_3, and
n=1 to 4 when m=1 to 4
x=300 to 500 when R_2 is equal to R_3
x=200 to 400 when R_2 is not equal to R_3
said acrylic polymer having an average molecular weight in the range of from about 35,000 to about 410,000; and

(c) from about 20% to about 50% by weight of an acid containing acrylic copolymer having the formula



wherein:
R_4 is H or, CH_3
R_5 is CH_3, CH_2CH_3 or, $(CH_2)_3CH_3$
o is equal to 4 to 12, and
p is equal to 1, and
y is equal to 350 to 800
said copolymer having an average molecular weight in the range of from about 140,000 to about 1,450,000.

4,539,286

FLEXIBLE, FAST PROCESSING, PHOTOPOLYMERIZABLE COMPOSITION

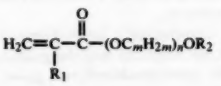
Melvin A. Lipson, Fullerton; Gene A. Derrico, Garden Grove; Sung Y. Tark, Irvine, and Toshio Yamazaki, Mission Viejo, all of Calif., assignors to Dynachem Corporation, Chicago, Ill.

Filed Jun. 6, 1983, Ser. No. 501,199
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—277 **25 Claims**

1. A photopolymerizable composition capable of being formed into a storable sheet or roll on a peelable support which on a 100 parts by weight basis consists essentially of:

A. from about 10 to about 60 parts by weight of an addition polymerizable material comprised of

(i) from about 5 to about 50 parts by weight of an acrylate having a boiling point greater than about 175° C. and having the formula



wherein m is from 1 to 4, n is from 1 to 12, R_1 is selected from the group consisting of H, CH_3 and mixtures thereof and R_2 is selected from the group consisting of unsubstituted phenyl, substituted phenyl, unsubstituted naphthenyl, substituted naphthenyl, branched or unbranched, substituted or unsubstituted alkyl having 1 to 12 carbon atoms, substituted or unsubstituted cycloalkyl having 5 or 6 carbon atoms in the ring and mixtures thereof and

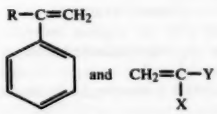
(ii) from about 5 to about 50 parts by weight of one or more non-gaseous compounds containing at least two terminal ethylenic groups and having a boiling point about 100° C.;

B. from about 0.001 to about 20 parts by weight of a photoinitiated free-radical generating addition polymerization initiating system;

C. from about 0.001 to about 5 parts by weight of a thermal-addition polymerization inhibitor; and

D. from about 40 to about 90 parts by weight of a preformed macromolecular polymeric binding agent which is a polymer of:

(i) a first monomeric material which contains one or more non-acidic compounds selected from the group having the general formulas



wherein R is hydrogen, an alkyl group having from 1 to 6 carbon atoms or a halo group and wherein, when X is hydrogen, Y is $OOCR_1$, OR_1, OCR_1, $COOR_1$, CN, $CH{=}CH_2$,

or Cl; when X is methyl, Y is $COOR_1$, CN, $CH{=}CH_2$, or

and when X is chlorine, Y is Cl; and wherein R_1 is an alkyl group having from 1 to 12 carbon atoms, a phenyl group or a benzyl group and R_3 and R_4 are hydrogen, an alkyl group having from 1 to 12 carbon atoms or a benzyl group; and

(ii) a second monomeric material which consists essentially of one or more alpha, beta-ethylenically unsaturated carboxylic-acid-or anhydride-containing monomers having from 3 to 15 carbon atoms;

wherein the ratio of the first monomeric material to the second monomeric material is sufficient to render substantially all of the binding agent soluble in a substantially wholly aqueous solution containing 1% by weight of sodium carbonate.

4,539,287

PROCESS FOR IMPROVING THE PRINTING QUALITY OF PHOTOHARDENABLE REPRODUCTION MATERIALS

Mario Grossa, Dreieich; Dieter H. Tigler, Rodermark, and Hubert Weinert, Langen, all of Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 378,395, May 14, 1982, abandoned. This application Jan. 19, 1984, Ser. No. 572,114
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1981, 3125564
Int. Cl.³ G03C 5/00
U.S. Cl. 430—300 10 Claims

1. A process for improving the printing quality of dry photohardenable reproduction materials for the production of relief printing plates consisting essentially of

(a) abrading the dry photohardenable surface of the material which consists essentially of a photopolymerizable or photocrosslinkable compound, a thermoplastic binder, and an initiator and/or an initiator system thereby forming a rough surface in the photohardenable material with grooves in the range of about 5 to 20 μm depth.

(b) smoothing the abraded dry photohardenable surface by filling in the abraded surface by a treatment taken from the group consisting of

(1) heat and/or pressure treatment,

(2) treatment with an organic solvent and/or solvent mixture for the thermoplastic binder of the photohardenable material, and

(3) treatment with a thermoplastic binder dissolved in a solvent,

the surface having a depth of grooves no greater than about 2 μm after the treatment

(c) exposing the smoothed surface imagewise to actinic radiation, and

(d) removing the unexposed areas of the smoothed surface by liquid development.

4,539,288

PROCESS FOR THE DEVELOPMENT OF RELIEF STRUCTURES BASED ON RADIATION-CROSSLINKED POLYMERIC PRECURSORS OF POLYMERS WHICH ARE RESISTANT TO HIGH TEMPERATURE

Hans-Joachim Merrem, Seeheim; Karlheinz Neisius, Darmstadt; Rudolf Klug, Aschaffenburg, and Hartmut Härtner, Mühltal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 15, 1983, Ser. No. 561,505
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246403
Int. Cl.³ G03C 1/70, 5/16
U.S. Cl. 430—325 12 Claims

1. In a process for forming relief structures convertible to heat-resistant polyimide polymers, comprising the steps of applying a photoresist comprising a soluble polyimide precursor containing radiation-reactive radicals, said photoresist being applied in the form of a layer or sheet to a substrate, drying the layer or sheet, irradiating the dried, radiation-sensitive layer or sheet through a negative original or using a guided collimated beam, dissolving out the non-irradiated portions of the layer or sheet using a developer fluid to develop a relief structure,

the improvement wherein said developer fluid consists essentially of a C_{3-7}-aliphatic or C_{3-7}-cycloaliphatic ketone; whereby said non-irradiated portions are rapidly removed with minimal erosion and swelling of the crosslinked layer, and the safety margin in the development time can be significantly increased.

4,539,289

SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Tsutomu Saito, and Keiji Mihayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 2, 1984, Ser. No. 585,692
Claims priority, application Japan, Mar. 2, 1983, 58-35177
Int. Cl.³ G03C 1/46, 1/08
U.S. Cl. 430—506 9 Claims

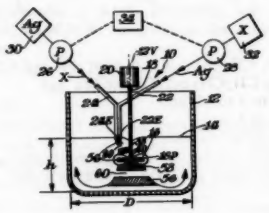
1. A silver halide light-sensitive material comprising a support comprising thereon (1) at least two emulsion layers having the same color sensitivity and being different in sensitivity, and (2) an intermediate layer sandwiched between said at least two emulsion layers, said intermediate layer containing comparatively light-insensitive silver halide grains of 0.05 to 0.6 μm in average grain size and wherein said intermediate layer does not contain couplers and has a sensitivity lower than the least sensitive layer of the two light-sensitive silver halide emulsion layers of the same color sensitivity by 0.5 or more log units.

4,539,290

PROCESS FOR PULSED FLOW, BALANCED DOUBLE JET PRECIPITATION

Clayton T. Mumaw, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1983, Ser. No. 536,410
Int. Cl.³ G03C 1/02
U.S. Cl. 430—569 8 Claims



1. In a process for double jet precipitation of silver halide particles in which a silver salt solution and a halide salt solution are each separately introduced into and diluted by a gelatin solution disposed in both a primary and a secondary mixing zone defined within a reaction vessel by a rotating mixing element, the gelatin solution being initially devoid of silver halide particles, the axis of rotation of the mixing element being coincident with the central axis of the reaction vessel, comprising the steps of:

(a) introducing a predetermined volume of one of the silver salt solution or the halide salt solution into the gelatin solution at a predetermined point spaced from the mixing member and substantially along its axis of rotation in the primary mixing zone;

(b) pausing a first predetermined time interval to allow the first salt solution to enter a predetermined distance into the gelatin solution;

(c) thereafter introducing a predetermined volume of the other of the salt solutions into the gelatin solution at substantially the same predetermined point in the primary mixing zone;

(d) pausing a second predetermined time interval to allow the second salt solution to enter a predetermined distance into the gelatin solution; and

(e) repeating steps (a) through (d).

4,539,291

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Nobuaki Inoue; Hiroyuki Mifune, and Koki Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 19, 1983, Ser. No. 562,628

Claims priority, application Japan, Dec. 24, 1982, 57-229552; Dec. 24, 1982, 57-229553

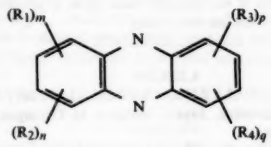
Int. Cl.³ G03C 1/36

U.S. Cl. 430—597 **11 Claims**

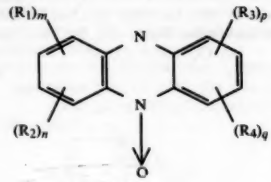
1. A direct positive silver halide photographic material, comprising:

a support base having thereon:

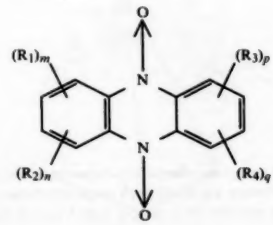
a silver halide emulsion layer containing previously surface fogged silver halide grains and a compound represented by a general formula selected from the group consisting of (I), (II) and (III) and a compound represented by a general formula selected from the group consisting of (IV), (V) and (VI):



(I)

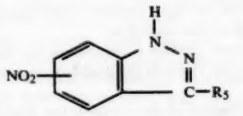


(II)



(III)

wherein R_1 to R_4, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group, a halogen atom, an alkoxy group, a hydroxy group, an acylamino group, a carboxy group, a nitro group, or a cyclic hydrocarbon condensed to a benzene ring; and m, n, p and q each represents 1, 2 or 3,



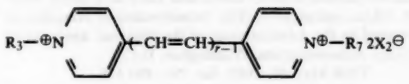
(IV)

wherein R_5 represents a hydrogen atom or an alkyl group having 1 to 5 carbon atoms and NO_2 may be positioned at 5-position, 6-position or 7-position,

(V)

wherein Y_1 and Y_2, which may be the same or different, each represents a non-metallic atomic group necessary for completing a pyridine ring, a benzothiazole ring, or a benzimidazole ring; and Y_1 and Y_2 may combine with each other to form a 1,10-phenanthroline ring; R_6 represents $—CH2—_{m1}$ (wherein m_1 represents 2, 3 or 4), —CH=CH—, or

and X_1 represents an anion,



(VI)

wherein R_7 represents an alkyl group; r represents 1 or 2, and X_2 represents an anion;

wherein compounds represented by formulae (I), (II), (III), (IV), (V) and (VI) are present in an amount sufficient to reduce D_{min} without reducing the contrast of an image formed by developing the silver halide photographic material.

4,539,292

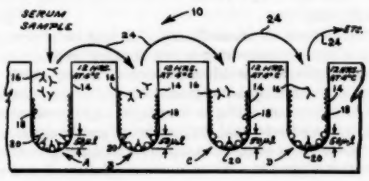
IMMUNOASSAY TECHNIQUE FOR SPECIFIC IMMUNOGLOBULIN E

Michael J. Reid, 3404 Royal Ct., Napa, Calif. 94558; J. Michael Kwasnicki, 113 Richard Pl., Vacaville, Calif. 95688, and Nai-Kong V. Cheung, 2101 Adelbert Rd., Cleveland, Ohio 44106

Filed Dec. 29, 1982, Ser. No. 454,219

Int. Cl.³ G01N 33/54

U.S. Cl. 435—7 **5 Claims**



1. A method for the quantitative determination of immunoglobulin E in a blood serum test sample which comprises the steps of:

(A) introducing into a polyvinyl chloride test well and incubating an immunologically reactive, specific antigen for about 60 minutes at about 37° C. to effect the absorption of said antigen on the wall of said test well;

(B) aspirating said specific antigen;

(C) introducing into said test well and incubating a globulin-free human serum albumin for about 60 minutes at about 4° C.;

(D) washing and drying said test well;

(E) introducing into said dry test well and incubating a blood serum test sample for from about 12 to 24 hours at about 4° C. to produce a blood serum supernatant fluid;

(F) serially transferring and incubating for from about 12 to 14 hours at about 4° C. said supernatant fluid to a succeeding polyvinyl chloride test well previously subjected to steps (A) to (D);

(G) continuing to serially transfer and incubate sequentially the said supernatant fluid to a pre-determined number of succeeding test wells each of which was previously subjected to steps (A) to (D);

(H) discarding said final supernatant fluid;

(I) introducing into each of said predetermined number of said test wells and incubating for from about 12 to 24 hours at about 4° C. a labeled, monoclonal, mouse, anti-human, immunoglobulin E antibody;

(J) quantitatively measuring and assaying the amount of specific immunoglobulin E in each of said predetermined number of test wells to provide a cumulative total content of specific immunologlobulin E in said blood serum test sample.

4,539,293

PRODUCTION OF BUTANOL BY FERMENTATION IN THE PRESENCE OF COCULTURES OF CLOSTRIDIUM

Sheryl L. Bergstrom, Duarte, Calif., and Gary L. Foutch, Stillwater, Okla., assignors to The United states of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 10, 1983, Ser. No. 493,179
Int. Cl.³ C12P 7/16; C12R 1/145
U.S. Cl. 435—160 **4 Claims**

1. A process for the production of butanol from sugar comprising the steps of:

mixing sugar with a coculture of a species of *Clostridium pasteurianum* and a species of *Clostridium butylicum;*

fermenting the sugar with the coculture to produce an organic solvent mixture containing butanol in which the amount of butanol is increased by at least 20 percent as compared to a fermentation process using *Clostridium butylicum,* and

recovering the butanol.

4,539,294

IMMOBILIZATION OF PROTEINS ON POLYMERIC SUPPORTS

Lincoln D. Metcalfe, Lagrange, and Dieter Frank, Naperville, both of Ill., assignors to Akzona Incorporated, Enka, N.C.

Filed Sep. 30, 1982, Ser. No. 431,891
Int. Cl.³ C12N 11/08, 11/02, 11/06; C07G 7/00
U.S. Cl. 435—180 **28 Claims**

1. A method of immobilizing a protein on a porous polymeric support, comprising a first soaking step in which said support is placed in a dilute solution of a long-chain cationic comprising a nitrogen compound having at least one alkyl or alkenyl group containing at least eight carbon atoms attached thereto in a solvent, said support being gently agitated during said first soaking step, and a second soaking step in which said support is soaked in a dilute aqueous solution of said protein.

4,539,295

BINARY KINETIC ASSAY METHOD AND APPARATUS

William M. Blough, Jr., Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

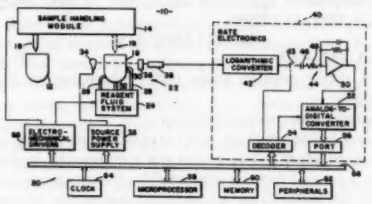
Filed Jun. 30, 1983, Ser. No. 509,903
Int. Cl.³ G01N 21/77, 33/00
U.S. Cl. 436—34 **10 Claims**

1. A method for providing an indication that a reaction between a sample containing at least a first analyte and a reagent is influenced by the presence of at least a second analyte in the sample also reacting with the reagent but at a rate different from the first analyte comprising the steps of:

performing a first reaction with only the first analyte and the reagent, measuring first and second reaction rates at respective first and second times during the first reaction, and forming a first ratio between the first and second reaction rates;

performing a second reaction with the sample and the reagent, measuring third and fourth reaction rates at the first and second times, respectively, during the second reaction, and forming a second ratio between the third and fourth reaction rates; and

comparing the first ratio and the second ratio and providing the indication if the second ratio is in a predetermined relationship with the first ratio.

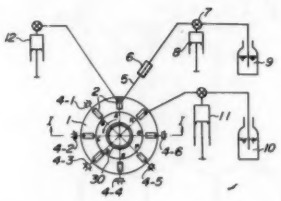


4,539,296

METHOD OF ANALYZING CHEMICAL SUBSTANCES

Sugio Manabe, Kodaira, Japan, assignor to Olympus Optical Co., Ltd., Japan

Continuation of Ser. No. 312,961, Oct. 20, 1981, abandoned.
This application Nov. 10, 1983, Ser. No. 550,507
Claims priority, application Japan, Oct. 24, 1981, 56-148135
Int. Cl.³ G01N 35/02
U.S. Cl. 436—47 **6 Claims**



1. A method of analyzing chemical substances in a sample by deriving an absorbance variation with respect to time of a test liquid which is a mixture of a sample liquid and at least one known reagent comprising the step of:

delivering a reagent into a first container to form a reagent blank;

moving the container containing the reagent successively through a plurality of photometric positions;

measuring absorbances of the reagent blank at respective photometric positions;

storing the measured absorbances of the reagent blank in a memory;

delivering a standard test liquid which is a mixture of a standard sample having a known concentation c and the reagent into a second container

moving the second container containing the standard test liquid succesively through the plurality photometric positions;

measuring absorbances of the standard test liquid at respective photometric positions;

deriving differences between absorbances of the reagent blank measured at at least two photometric positions, and the absorbances of the standard test liquid measured at

corresponding photometric positions to produce at least two corrected absorbances of the standard test liquid;

deriving an absorbance variation per unit time from a difference between the corrected absorbances of the standard test liquid;

calculating a converting coefficient I from said absorbance variation per unit time in the corrected absorbances of the standard test liquid and the known concentration c of the substances in the standard sample;

storing the converting coefficient I thus calculated in the memory;

delivering a test liquid into a third container;

moving the third container containing the test liquid successively through the photometric positions;

measuring absorbances of the test liquid at respective photometric positions;

deriving differences between the absorbances of the reagent blank measured at at least two photometric positions and the absorbances of the test liquid measured at corresponding photometric positions to produce at least two corrected absorbances of the test liquid;

deriving an absorbance variation per unit time from a difference between the corrected absorbances of the test liquid; and

calculating a concentration of the substances in the sample liquid from said absorbance variation per unit time in the absorbance of the test liquid and said converting coefficient I.

4,539,297

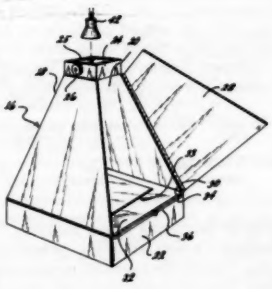
ULTRAVIOLET IMAGING METHOD AND APPARATUS

Patrick E. Clarke, Glendale, and Gary Wilcox, Malibu, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 355,154, Mar. 5, 1982, abandoned. This application Sep. 15, 1983, Ser. No. 533,165

Int. Cl.³ G01N *27/26, 33/48*

U.S. Cl. 436—164 **3 Claims**



1. Apparatus for providing an image of at least one zone of ultraviolet light absorbing material in a medium substantially transparent to ultraviolet light comprising:

a source of ultraviolet light; and

an enclosure, said enclosure defining an aperture for entrance thereinto of ultraviolet light from said ultraviolet source , said enclosure including means for holding a medium containing at least one zone of ultraviolet light absorbing material, sand enclosure further including means for holding photographic film to be disposed adjacent said medium containing at least one zone of ultraviolet lights absorbing material, said means for holding said medium and said means for holding said photographic film being positioned such that ultraviolet light from said aperture passes through said medium to impinge upon said photographic film so that unfocused ultraviolet light impinging upon said film forms an approximate size duplicate image of said at least one zone of the material of said film.

4,539,298

HIGHLY HEAT-CONDUCTIVE CERAMIC MATERIAL

Katsutoshi Komeya, Oiso; Akihiko Tsuge, Yokohama; Hiroshi Inoue, Kawaguchi, and Hiroyasu Ohta, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 23, 1982, Ser. No. 443,955

Claims priority, application Japan, Nov. 25, 1981, 56-187761; Oct. 14, 1982, 57-179096

Int. Cl.³ C04B *35/56, 35/58*

U.S. Cl. 501—89 **7 Claims**

1. A highly heat-conductive ceramic material which consists essentially of (i) an amount of silicon carbide not less than about 20% by weight and up to about 85% by weight, (ii) from about 0.1 to about 5% by weight of at least one metal oxide selected from the group consisting of calcium oxide, barium oxide and strontium oxide, (iii) 0 to about 5% by weight of carbon, and (iv) the balance of aluminum nitride.

4,539,299

MICROCOMPOSITE OF METAL BORIDE AND CERAMIC PARTICLES

Milivoj K. Brun, Ballston Lake; Minyoung Lee, and Lawrence E. Szala, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 529,784, Sep. 6, 1983, Pat. No. 4,512,946. This application Jul. 26, 1984, Ser. No. 634,911

Int. Cl.³ C04B *35/58*

U.S. Cl. 501—96 **11 Claims**

1. An electrically conducting polycrystalline microcomposite comprised of a continuous interconnecting phase of a boride of a metal selected from the group consisting of hafnium, niobium, tantalum, titanium, vanadium, zirconium and mixtures thereof and a phase comprised of ceramic particles, said continuous metal boride phase encapsulating at least about 20% by volume of said phase of ceramic particles and encapsulating or being intermixed with the balance of said ceramic particles, said metal boride phase having an average grain size of less than about 15 microns, said ceramic particles having an average particle size of less than about 15 microns and being comprised of ceramic grains and clusters of grains, said encapsulating metal boride phase encapsulating individual ceramic grains and/or individual clusters of grains, said microcomposite having a density greater than 95% of the theoretical density for said microcomposite, said continuous metal boride phase ranging from about 20% by volume to about 80% by volume of said microcomposite.

4,539,300

METHOD FOR THE FABRICATION OF HEXAGONAL BN TOUGHENED MATRIX COMPOSITES

William S. Coblenz, Fort Washington, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 21, 1983, Ser. No. 534,478

Int. Cl.³ C04B *35/58*

U.S. Cl. 501—98 **1 Claim**

1. A process for producing a BN-toughened mullite, the steps of which comprise:

wet-milling in a non-polar liquid a mixture consisting essentially of a first reactant chosen from group consisting of

B_2O_3, H_3BO_3 and mixtures thereof and a second reactant consisting essentially of AlN and Si_3N_4;
densifying said reactants at about 1000°–1200° C.;

reacting said reactants in a furnace at 1650°–1700° C. in a nitrogen atmosphere to produce a mullite body having hexagonal particles of BN dispersed evenly throughout.

4,539,301

GRAPHITE-CONTAINING REFRACTORIES

Toshiaki Kaneko; Ichiro Takita, and Hiroshi Shikano, all of Kitakyushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Kitakyushu, Japan

Filed Mar. 5, 1984, Ser. No. 586,055
Claims priority, application Japan, Mar. 12, 1983, 58-40963
Int. Cl.³ C04B *35/54*
U.S. Cl. 501—99 **1 Claim**

1. Graphite-containing refractories comprising a refractory aggregate and at least 3 wt % with respect of said aggregate of a thin, flaky graphite raw material wherein at least 30 % by weight of said thin, flaky graphite material has a size of $D \geqq 0.105$ mm and $t \leqq 10$ μm, wherein D represents the size of the extent of the surface of a flaky layer and t represents the thickness of a flake, said flaky graphite being obtained by refining and processing a naturally occuring mineral.

4,539,302

RECOVERY OF ZEROVALENT NICKEL COMPLEXES

William R. Leyendecker, and Morris Rapoport, both of Orange, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 30, 1984, Ser. No. 605,311
Int. Cl.³ B01J *31/40*; C07C *120/02, 121/26*; C07F *15/04*
U.S. Cl. 502—24 **9 Claims**

1. A process for recovery of a catalyst comprising zerovalent nickel and organophosphorus ligand from a dinitrile hydrocyanation product fluid containing unreacted mononitriles wherein the recovered catalyst has a ligand to nickel ratio lower than the ligand to nickel ratio of the catalyst in the product fluid which process comprises controlling the level of unreacted mononitriles in the product fluid from the hydrocyanation to about 3–20% by weight based upon the weight of the product fluid and the ligand to nickel molar ratio less than about 9/1, causing the thus treated stream to form two phases, separating the phases and returning at least a portion of the heavier phase to the hydrocyanation reaction.

2. The process of claim 1 wherein the product fluid is maintained at a temperature in the range 25°–65° C.

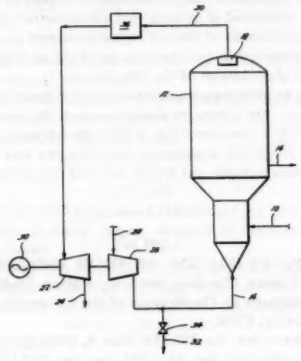
5. The process of claim 1 wherein at least a portion of the heavier phase is combined with catalyst prepared by reacting elemental nickel with organophosphorus ligand and the combination introduced into the hydrocyanation reaction.

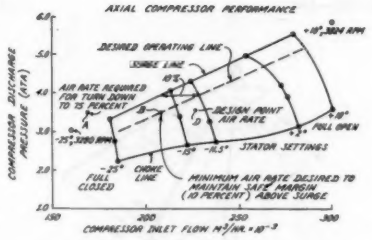
4,539,303

PROCESS FOR IMPROVING POWER RECOVERY FROM REGENERATION GAS UNDER TURNDOWN CONDITIONS

John P. MacLean, Stafford; Joel S. Bittensky, and James H. Colvert, both of Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 306,048, Sep. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 141,454, Apr. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 920,100, Jun. 28, 1978, abandoned. This application Dec. 7, 1983, Ser. No. 559,058
Int. Cl.³ B01J *21/20, 29/38*; C10G *11/00*; F02C *9/02*
U.S. Cl. 502—39 **3 Claims**




AXIAL COMPRESSOR PERFORMANCE
DESIRED OPERATING LINE
SURGE LINE
AIR RATE REQUIRED FOR TURN DOWN TO 75 PERCENT
DESIGN POINT AIR RATE
FULL OPEN
STATOR SETTINGS
FULL CLOSED
CHOKE LINE
MINIMUM AIR RATE DESIRED TO MAINTAIN SAFE MARGIN (10 PERCENT) ABOVE SURGE
COMPRESSOR DISCHARGE PRESSURE (ATA)
COMPRESSOR INLET FLOW

1. A method for increasing power recovery from a motor-generator/expander power recovery turbine/axial flow air compressor set, wherein the expander power recovery turbine drives the axial flow air compressor and either the expander power recovery turbine drives the motor-generator or the motor-generator supplements the drive of the axial flow air compressor; and the axial flow air compressor compresses and supplies air to a lower portion of a regenerator wherein coke contaminated, partially deactivated catalyst is regenerated in a fluidized catalytic cracking process wherein in the regenerator the catalyst is fluidized into a dense phase and a dilute phase by the upward flow of air from the lower portion of the regenerator and the air oxidizes the coke in the dense phase and the dilute phase and thereby regenerates the partially deactivated catalyst and produces a hot flue gas comprising oxides of carbon which hot flue gas drives the expander power recovery turbine which expander power recovery turbine drives the axial flow air compressor; wherein the fluidized catalytic cracking process is under a turndown condition wherein insufficient flow of coke contaminated, partially deactivated catalyst is provided to the regenerator; insufficient in that the air rate required to oxidize essentially all the coke is less than the

air rate necessary to avoid axial flow air compressor surge, the method comprising:

(a) adjusting axial flow air compressor air rate set point to a speed about 10% above surge; thereby

(b) increasing air rate to an amount in excess of regeneration requirement,

(c) flowing all air thereby compressed to the regenerator, and

(d) using complete combustion catalyst in the fluidized catalytic cracking process, thereby oxidizing essentially all coke on the coke contaminated, partially deactivated catalyst to carbon dioxide in the dense phase of the regenerator and producing a hot flue gas essentially free of carbon monoxide, and

(e) driving the expander power recovery turbine with all the hot flue gas produced, and thereby

(f) driving the motor-generator and generating electricity.

2. In a process for recovering power from motor-generator-/expander power recovery turbine/axial flow air compressor set, wherein the expander power recovery turbine drives the axial flow air compressor and either the motor-generator supplements the drive of the axial flow air compressor or the expander power recovery turbine drives the motor-generator; and the axial flow air compressor compresses and supplies air to a lower portion of a regenerator wherein coke contaminated, partially deactivated catalyst is regenerated in a fluidized catalytic cracking process wherein in the regenerator the catalyst is fludized into a dense phase and a dilute phase by the upward flow of air from the lower portion of the regenerator and the air oxidizes the coke in the dense phase and the dilute phase to oxides of carbon and thereby regenerates the deactivated catalyst and produces a hot flue gas which hot flue gas drives the power recovery turbine which power recovery turbine drives the axial flow air compressor; wherein the fluidized catalytic cracking process is under a turndown condition wherein insufficient flow of coke on partially deactivated catalyst is provided to the regenerator, insufficient in that the air rate required to oxidize essentially all the coke is less than the air rate necessary to avoid axial flow air compressor surge and wherein axial flow air compressor air rate set point is adjusted to an air rate above the rate at which compressor surge occurs, thereby driving the air compressor to compress more air than necessary to oxidize all coke and wherein to avoid afterburn in the dilute phase, excess air is vented to the atmosphere wherein the improvement comprises:

(a) adjusting axial flow air compressor air rate set point to about 10% above surge; thereby

(b) compressing an amount of air in excess of regeneration requirements,

(c) flowing all air compressed by the axial flow air compressor to the regenerator, and

(d) using complete combustion catalyst in the fluidized catalytic cracking process thereby with all the air compressed and flowed, oxidizing essentially all coke on the coke contaminated catalyst to carbon dioxide in the dense phase of the regenerator and thereby producing a hot flue gas essentially free of carbon monoxide, and

(e) driving the expander power recovery turbine with all the hot flue gas produced, and thereby

(f) driving the motor-generator and generating electric power.

3. In a process which produces flue gas contaminants when spent hydrocarbon cracking catalysts having coke deposited thereon are regenerated, comprising

(a) burning the coke on the spent catalyst in a regenerator to produce a catalyst having a coke on regenerated catalyst level less than 0.2 wt % and a flue gas containing less than 2.0 vol % carbon monoxide;

(b) expanding the flue gas from the regenerator through an expander power recovery turbine to drive an axial flow air compressor of a motor-generator/expander power recovery turbine/axial flow air compressor set to reduce the pressure thereof;

(c) recovering the energy produced from the expansion;

wherein insufficient coke is supplied to the regenerator to produce sufficient flue gas to expand through the expander and to drive the axial flow air compressor at other than surge, wherein the improvement comprises:

(1) adjusting axial flow air compressor air rate to about 10% above surge; thereby

(2) compressing an amount of air in excess of regeneration requirements,

(3) flowing all air compressed by the axial flow air compressor to the regenerator, and

(4) using complete combustion catalyst with the spent catalyst in the fluidized catalytic cracking process thereby with all the air compressed, oxidizing essentially all coke to carbon dioxide and thereby producing a flue gas reduced in carbon monoxide, and

(5) driving the expander power recovery turbine with all the flue gas produced and thereby

(6) driving the motor-generator and generating electric power.

4,539,304

PRETREATMENT METHOD FOR INCREASING CONVERSION OF REFORMING CATALYST

Leslie A. Field, Emeryville, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 8, 1984, Ser. No. 587,419

Int. Cl.³ B01J *29/06, 37/08*

U.S. Cl. 502—66 **16 Claims**

16. A method of pretreating a catalyst comprising:

(a) reducing said catalyst in the presence of hydrogen at a temperature of 200° C. for at least twenty minutes; and

(b) maintaining the temperature of the reduced catalyst at about 475° C. for at least ten minutes; wherein said catalyst comprises:

(1) a type L zeolite containing from 8% to 10% by weight barium and from 0.1% to 1.5% by weight platinum; and

(2) an inorganic binder selected from the group consisting of silica, alumina, aluminosilicates, and clays.

4,539,305

PRETREATMENT METHOD FOR ENHANCING THE SELECTIVITY AND INCREASING THE STABILITY OF A REFORMING CATALYST

Charles R. Wilson, San Francisco; Waldeen C. Buss, Kensington, and Leslie A. Field, Emeryville, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 8, 1984, Ser. No. 587,481

Int. Cl.³ B01J *29/06, 37/08*

U.S. Cl. 502—66 **17 Claims**

1. A pretreatment method for enhancing the selectivity and increasing the stability of a reforming catalyst comprising a large-pore zeolite containing at least one Group VIII metal, wherein said method comprises:

(a) reducing said catalyst in a reducing atmosphere at a temperature of from 250° C. to 650° C.;

(b) exposing said reduced catalyst to an oxygen-containing gas;

(c) treating said exposed catalyst in a reducing atmosphere at from 120° C. to 260° C.; and

(d) maintaining the temperature of the treated catalyst at from 370° C. to 600° C. in a reducing atmosphere.

17. A pretreatment method for enhancing the selectivity and increasing the stability of a reforming catalyst comprising:

(A) a type L zeolite containing from 8% to 10% by weight barium and from 0.1% to 1.5% by weight platinum; and

(B) an inorganic binder selected from the group consisting of silica, alumina, aluminosilicates, and clays; wherein said pretreatment method comprises:

(a) reducing said catalyst in the presence of hydrogen at a temperature of from 350° C. to 550° C.; and

(b) exposing said reduced catalyst to air;

(c) treating said exposed catalyst in the presence of hydro-

gen at atmospheric pressure for at least twenty minutes at from 120° C. to 260° C.; and

(d) maintaining the temperature of the treated catalyst at from 370° C. to 600° C. in a reducing atmosphere for about ten minutes.

4,539,306

USE OF MIXED METAL CATALYSTS IN THE HYDROFORMYLATION OF OLEFINS TO PRODUCE LINEAR ALDEHYDES AND ALCOHOLS

Biau-Hung Chang, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 414,382, Sep. 2, 1982, Pat. No. 4,453,019. This application Feb. 13, 1984, Ser. No. 579,304

Int. Cl.³ B01J *31/20*

U.S. Cl. 502—154 **9 Claims**

1. A hydroformylation catalyst composition comprising in admixture a first transition metal compound and a second transition metal compound wherein said first transition metal compound is selected from the group consisting essentially of anionic and neutral Group VIII transition metal compounds; and

wherein said second transition metal compound has the following general formula:

$$M^{+n}[H_yA_xL_z]^{-n}$$

wherein

n is an integer greater than or equal to 2;

M is a cationic species;

A is a transition metal selected from the group consisting essentially of Ru, Os, Fe, Cr, Co, Rh, Ir, Mo and W;

x is an integer greater than or equal to 1;

L is a ligand;

z is an integer greater than or equal to the available coordination bonding sites of A; and

y is an integer greater than or equal to 0.

8. A hydroformulation catalyst composition claimed in claim 1 wherein L represents trialkyl phosphine, trialkyl arsine, trialkyl antimony, trialkyl bismuth, triaryl phosphine, triaryl arsine, triaryl antimony, triaryl bismuth, tertiary amine, carbon monoxide and halide,

and wherein M represents a cationic species selected from the group consisting of Group Ia metals, Group IIa metals, iminium, ammonium, phosphonium and arsenium.

4,539,307

ACTIVATION OF PLATINUM CONTAINING REFORMING CATALYSTS

Soni O. Oyekan, Piscataway, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Filed Mar. 12, 1984, Ser. No. 588,627

Int. Cl.³ B01J *27/02;* **C10G** *35/06*

U.S. Cl. 502—223 **10 Claims**

1. A process for activating a metal catalyst, comprised of platinum and rhenium supported on a porous solid carrier, for reforming a hydrocarbon feedstock by contact of the feedstock with the activated catalyst at reforming conditions, the steps of activation comprising:

(a) contacting the catalyst with an oxygen-containing gas at a temperature sufficient to oxidize the metal catalyst;

(b) reducing the oxidized catalyst, sequentially, by first contacting the catalyst with a hydrogen containing gas at about 650° to about 750° F. for a first period of time, raising the temperature to about 900° to about 1000° F. and continuing the reduction in hydrogen for a second period of time; and

(c) sulfiding the reduced catalyst.

4,539,308

OLEFIN METATHESIS CATALYST

Simon G. Kukes, and Robert L. Banks, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 539,213, Oct. 5, 1983, Pat. No. 4,499,328. This application Sep. 19, 1984, Ser. No. 652,026

Int. Cl.³ B01J *21/08, 23/30, 23/50*

U.S. Cl. 502—243 **8 Claims**

1. A catalytic composition suitable for the disproportionation of olefins consisting silica of and tungsten oxide promoted with an effective promoting amount of silver oxide.

4,539,309

PREPARATION OF A CATALYST FOR THE OXIDATION OF SULFUR DIOXIDE TO SULFUR TRIOXIDE

Ruprecht Meissner, Weisenheim, and Norbert Neth, Bobenheim-Roxheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,096

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3322940

Int. Cl.³ B01J *23/04, 23/22*

U.S. Cl. 502—247 **3 Claims**

1. A process for the preparation of a catalyst for the oxidation of sulfur dioxide to sulfur trioxide, said catalyst consisting essentially of a silica-based carrier on which is supported an active substance containing vanadium and alkali metal compounds, said process comprising: dissolving vanadium pentoxide in an alkali solution, acidifying the solution with sulfuric acid, mixing the acidified solution with the carrier, molding the mixture, drying and calcining, wherein

(a) the vanadium pentoxide solution used additionally contains a dissolved alkali metal silicate, silica sol or mixtures thereof

(b) this solution is brought to ph <2 by adding the solution to the required amount of sulfuric acid, the temperature being kept below 35° C., and

(c) the acidified solution is immediately mixed with the solid silica-based carrier to give a moist crumbly material, which is then immediately molded, with the proviso that,

(d) the moist crumbly material contains from 2 to 6% by weight of V_2O_5 and from 35 to 45% by weight of H_2O and has a total SiO_2 content of from 15 to 50% by weight, from 5 to 25% by weight of the total silica having been introduced into the moist crumbly material together with the solution from (a).

4,539,310

STEAM REFORMING CATALYST

Harry P. Leftin, and Kashinath Z. Patil, both of Houston, Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Division of Ser. No. 286,427, Jul. 24, 1981, abandoned, which is a continuation-in-part of Ser. No. 117,684, Feb. 1, 1980, abandoned. This application May 30, 1984, Ser. No. 615,337

Int. Cl.³ B01J *21/06, 23/10, 23/74*

U.S. Cl. 502—303 **4 Claims**

1. A sulfur resistant catalyst having a plurality of oxides, for steam reforming hydrocarbons containing from about 1 part per million to about 5 weight percent sulfur, which in the unreduced condition consists essentially of:

(a) from about 20 to about 50 weight percent nickel oxide;

(b) from about 10 to about 25 weight percent of one or more oxides of the lanthanons having atomic numbers 57 through 71; and

(c) from about 25 to about 70 weight percent zirconium dioxide.

4,539,311

PROCESS FOR MAKING A LEAD-TOLERANT CATALYST SYSTEM FOR PURIFYING EXHAUST

Brian Harrison, and Alan F. Diwell, both of Oxfordshire, England, assignors to Johnson Matthey Public Limited Company, London, England

Filed Jun. 20, 1984, Ser. No. 622,550

Claims priority, application United Kingdom, Jun. 27, 1983, 8317380

Int. Cl.[3] **B01J** *21/04, 23/10, 23/78*

U.S. Cl. 502—304 **5 Claims**

1. A process for making a lead tolerant catalyst system comprising a catalyst consisting essentially of platinum group metal carried on supported alumina having a surface area of at least 50 m^2/g which process comprises impregnating the supported alumina with a solution of a barium compound, subjecting the alumina to an intermediate firing at a temperature of at least 400° C., subsequently impregnating the alumina with a solution of a compound selected from the group consisting of compounds of platinum, palladium and rhodium and then subjecting the alumina to a firing at a temperature of at least 400° C.

4,539,312

USE OF DIAMINO KETONES AS ANALGESIC AGENTS

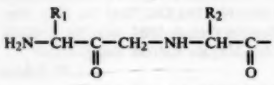
Norma G. Delaney, Princeton, and Eric M. Gordon, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

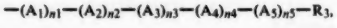
Filed Jul. 11, 1984, Ser. No. 629,934

Int. Cl.[3] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 514—16 **15 Claims**

1. A method of relieving pain in a mammalian host suffering therefrom, which comprises administering an effective amount of a compound having the formula



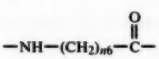


or a pharmaceutically acceptable salt thereof, wherein

R_1 and R_2 are each independently hydrogen, alkyl, carboxyalkyl, halo substituted alkyl, hydroxyalkyl, aminoalkyl, mercaptoalkyl, alkylthioalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, arylalkyl, carbamoylalkyl, guanidinylalkyl, or heteroaryl;

R_3 is hydroxy, alkoxy, (substituted alkyl)oxy, arylalkoxy, (heteroaryl)alkoxy or $—NY_1Y_2$, wherein Y_1 and Y_2 are each independently hydrogen, alkyl, aryl, or arylalkyl, or Y_1 is hydrogen and Y_2 is substituted alkyl or (heteroaryl)alkyl;

A_1 is glycyl, alanyl, leucyl, phenylalanyl, arginyl, sarcosyl, seryl, asparagyl, lysyl, glutamyl, histidyl, tryptophyl, cysteinyl, methionyl, threonyl, tyrosyl, leucyl, valyl, aspartyl, prolyl, norleucyl, norvalyl, or



wherein n_6 is an integer of 2 to 15;

A_2, A_3, A_4 and A_5 each is independently glycyl, alanyl, leucyl, phenylalanyl, arginyl, sarcosyl, seryl, asparagyl, lysyl, glutamyl, histidyl, tryptophyl, cysteinyl, methionyl, threonyl, tyrosyl, leucyl, valyl, aspartyl, prolyl, norleucyl, or norvalyl; and

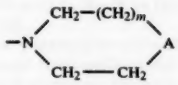
n_1, n_2, n_3, n_4 and n_5 each is independently 0 or 1; and wherein

the terms "alkyl" and "alkoxy" refer to straight and branched chain groups having 1 to 7 carbon atoms;

the term "halo substituted alkyl" refer to alkyl groups in which one, or more, hydrogens have been replaced by chloro, bromo, or fluoro groups;

the term "cycloalkyl" refers to cycloalkyl groups having 3, 4, 5, 6, or 7 carbon atoms;

the term "substituted alkyl" refers to alkyl groups substituted with one, or more, hydroxy or $—NY_3Y_4$ groups wherein Y_3 and Y_4 are the same or different and each is hydrogen or alkyl, Y_3 is hydrogen and Y_4 is aryl, or Y_3 and Y_4 together with the nitrogen atom to which they are attached form a heterocyclic group having the formula



and A is CH—Q, oxygen, or N—Q, Q is hydrogen or alkyl and m is 0 or 1;

the term "heteroaryl" refers to 2- or 3-furanyl, 2- or 3-thienyl, 2-, 3- or 4-pyridinyl, 4-imidazolyl and 3-indolyl; and

the term "aryl" refers to phenyl and phenyl substituted with 1, 2 or 3 alkyl, alkoxy, alkylthio, hydroxy, chlorine, bromine, fluorine, amino, alkylamino, dialkylamino, nitro or trifluoromethyl groups.

4,539,313

(2'-5')-OLIGO (3'-DEOXYANDENYLATE) AND DERIVATIVES THEREOF

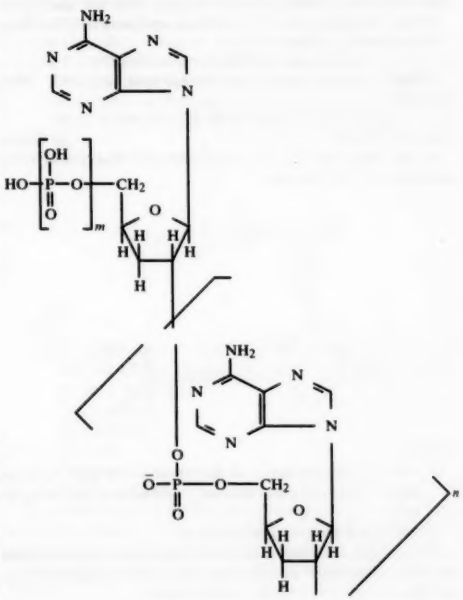
Robert I. Suhadolnik, Roslyn, Pa.; Joseph M. Wu, Mohegan Lake, N.Y.; Paul Doetsch, Beltsville, Md., and Earl E. Henderson, Elkins Park, Pa., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 252,926, Apr. 10, 1981, Pat. No. 4,464,359. This application Apr. 27, 1984, Ser. No. 605,004

Int. Cl.[3] **A61K** *31/70*

U.S. Cl. 514—47 **6 Claims**

1. An anti-viral composition effective against *Herpes simplex virus* which comprises an effective amount of a compound of the formula



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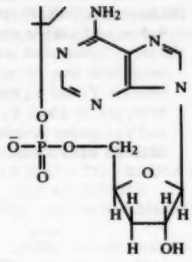


wherein m is 0,1,2 or 3 and n is 0,1,2,3 or 4, and a pharmaceutically acceptable carrier.

3. An anti-viral composition effective against *Herpes Simplex* virus which comprises an effective amount of a compound selected from the group consisting of:

3'-Deoxyadenylyl-(2'-5')3'-deoxyadenylyl-(2'-5')3'-deoxyadenosine triphosphate,

3'-Deoxyadenylyl-(2'-5')3'-deoxyadenylyl-(2'-5')3'-deoxyadenosine diphosphate,

3'-Deoxyadenylyl-(2'-5')3'-deoxyadenylyl-(2'-5')3'-deoxyadenosine phosphate, and

3'-Deoxyadenylyl-(2'-5')3'-deoxyadenylyl-(2'-5')3'-deoxyadenosine.

5. A method of controlling infection by *Herpes Simplex* virus which comprises administering to a subject infected with said virus an effective amount of a composition of claim 1.

6. A method of combatting infection by *Herpes Simplex* virus which comprises administering to a subject infected with said virus, an effective amount of a composition of claim 3.

4,539,314

PHOSPHORYL-TRIAZINES

Odd Kristiansen, Möhlin; Jozef Drabek, Oberwil, and Victor Flück, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

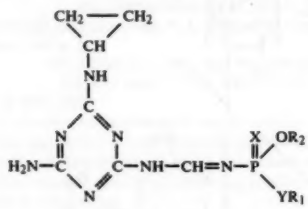
Filed Jun. 1, 1984, Ser. No. 616,371

Claims priority, application Switzerland, Jun. 13, 1983, 3224/83

Int. Cl.[3] **C07F** *9/65;* **C07D** *251/70;* **A01N** *43/68*

U.S. Cl. 514—84 **10 Claims**

1. An N-phosphoryl- or thiophosphoryl-N'-s-triazinyl-formamidine of the formula



(I)

wherein

R_1 and R_2 independently of one another are each C_1–C_{20}-alkyl, or phenyl unsubstituted or substituted by halogen, and

Y and Y are each oxygen or sulfur.

9. An insecticidal and acaridical composition which contains as active ingredient an effective amount of a compound according to claim 1, together with a carrier.

4,539,315

SUBLINGUALLY ABSORBABLE NONTOXIC ASPIRIN COMPOSITION

Charles E. Bender, deceased, late of Fairfield, Pa., and Audrey L. Bender, executrix, Huntington Valley, Pa., assignors to Dynatech Laboratories, Incorporated, Alexandria, Va.

Continuation-in-part of Ser. No. 357,074, Apr. 11, 1982, Pat. No. 4,446,132. This application Oct. 31, 1983, Ser. No. 547,130

The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.

Int. Cl.[3] **A61K** *31/61, 31/615*

U.S. Cl. 514—162 **9 Claims**

1. A method of sublingually treating headaches and other disorders normally treated with aspirin comprising the steps of providing an admixture comprising acetylsalicylic acid and glycine in dosage form in which the glycine is unreacted with said acid, and placing the dosage form of said admixture in the human mouth without swallowing it for reaction with the saliva in the mouth, the unreacted glycine in said admixture being present in an amount effective to cause the acetylsalicylic acid to react sufficiently with the saliva to sublingually pass the medication in said admixture into the blood stream.

4,539,316

PYRIDINE DERIVATIVES OF 1,2-DIAMINOCYCLOBUTENE-3,4-DIONES

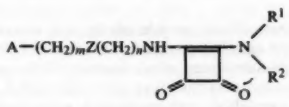
Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 503,996, Jun. 13, 1983, Pat. No. 4,503,051, which is a division of Ser. No. 369,971, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 264,533, May 18, 1981, Pat. No. 4,390,701. This application Oct. 1, 1984, Ser. No. 656,576

Int. Cl.[3] **C07D** *213/63, 213/50, 401/06;* **A61K** *31/44*

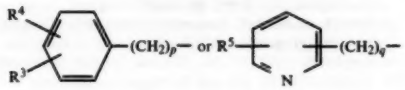
U.S. Cl. 514—212 **10 Claims**

1. A compound of the formula



I

wherein R^1 and R^2 each are independently hydrogen or (lower)alkyl, and, when R^1 is hydrogen, R^2 also may be allyl, propargyl, cyclo(lower)alkyl(lower)alkyl, cyclo(lower)alkyl, cyano(lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, hydroxy, 2,3-dihydroxypropyl,



in which

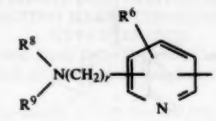
p is an integer of from 1 to 6 inclusive, q is an integer of from 1 to 6 inclusive, R^3 and R^4 each are independently hydrogen, (lower)alkyl, hydroxy, (lower)alkoxy or halogen, and, when R^3 is hydrogen, R^4 also may be trifluoromethyl, or R^3 and R^4, taken together, may be methylenedioxy, R^5 is hydrogen, (lower)alkyl, (lower)alkoxy, hydroxy, amino or halogen;

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is sulfur, oxygen or methylene; and

A is



in which
R^6 is hydrogen, (lower)alkyl, (lower) alkoxy or halogen;
r is an integer of from 1 to 4 inclusive; and
R^8 and R^9 each are independently hydrogen, (lower)alkyl, allyl, propargyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, cyclo(lower)alkyl, or phenyl(lower)alkyl, provided that R^8 and R^9 may not both be cyclo(lower)alkyl, or R^8 and R^9, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, hydroxypiperidino, N-methylpiperazino, 1,2,3,6-tetrahydropyridyl, 3-pyrrolino, homopiperidino, heptamethyleneimino, octamethyleneimino or 3-azabicyclononane;
or a nontoxic, pharmaceutically acceptable salt, hydrate or solvate thereof.

8. A composition for treating a condition mediated through histamine H_2-receptors comprising at least one compound of claim 1 in an amount effective to inhibit said histamine H_2-receptors and a pharmaceutically acceptable carrier.

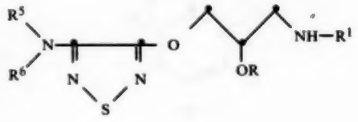
4,539,317

4-SUBSTITUTED AMINO-3-[3-ALKYLINDOLOAMINO-2-HYDROXY-PROPOXY] THIADIAZOLES, COMPOSITIONS AND PHARMACEUTICAL USE

John J. Baldwin, Gwynedd Valley, and Gerald S. Ponticello, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 9, 1984, Ser. No. 597,990
Int. Cl.[3] **A61K** *31/425, 31/535;* **C07D** *417/12, 417/14*
U.S. Cl. 514—222 **8 Claims**

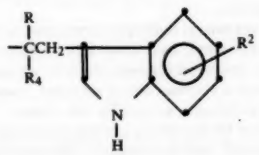
1. A compound having the formula:



I

wherein:
R is hydrogen;

wherein R_a is C_1–C_8 alkyl; C_{63} or C_{10} aryl;
R^1 is



wherein:
R^2 is
hydrogen;
halo (F, Br, Cl);
hydroxy;
C_1–C_8 alkyl;
C_{1-C8} alkoxy;
R^3 and R^4 are independently hydrogen; C_1–C_5 alkyl;
R^5 and R^6 are independently
lower alkyl of C_1–C_6;
or R^5 and R^6, together with the Natom, can be joined to form a 5- or 6-membered ring wherein the 6-membered ring can contain an O, S, N—H, or N-lower (C_1–C_6) alkyl heteroatom; and,
the pharmacologically acceptable acid addition salts thereof.

7. A pharmaceutical composition useful for treating hypertension or effecting β-adrenergic blockade comprising a pharmaceutically acceptable carrier; and, an antihypertensively or β-adrenergic blockading effective amount of a compound of claim 1.

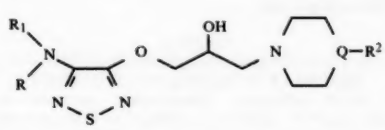
4,539,318

TERTIARY AMINOHYDROXYPROPOXY SUBSTITUTED THIADIAZOLES, PHARMACEUTICAL COMPOSITIONS AND USE

John J. Baldwin, Gwynedd Valley, and Gerald S. Ponticello, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 4, 1984, Ser. No. 617,296
Int. Cl.[3] **A61K** *31/535, 31/54;* **C07D** *413/14, 417/14*
U.S. Cl. 514—222 **5 Claims**

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof wherein:
R and R^1 are independently:
(1) C_{1-8} alkyl, either straight or branched chain,
(2) R and R^1 are joined together directly to form, with the nitrogen to which they are attached, pyrrolidino or piperidino, or through a heteroatom selected from O, N-(C_{1-3} alkyl) and S to form a six-membered heterocycle;
Q is >N- or

and
R^2 is
(1) a carbocycle or heterocycle of 6 nuclear atoms, 0, 1 or 2 of which can be nitrogen atoms and either unsubstituted or substituted with
(i) C_{1-3} alkyl,
(ii) hydroxy,
(iii) halo,
(iv) cyano, or
(v) C_{1-3} alkoxy.

5. A method of antagonizing α_1-adrenergic receptors and serotonin release which comprises the administration to a patient in need of such treatment of an effective amount of the compound of claim 1 or a pharmaceutically acceptable salt thereof.

4,539,319
AMIDINE DERIVATIVES

Peter M. Newsome, Cheam; Noel A. Mullan, Cranleigh, and John P. Marshall, Lacey Green, all of England, assignors to Beecham Group p.l.c., England

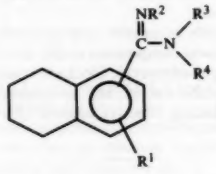
Filed Jun. 14, 1983, Ser. No. 504,257

Claims priority, application United Kingdom, Jun. 16, 1982, 8217452

Int. Cl.[3] **A61K** *31/155, 31/445;* **C07C** *123/00;* **C07D** *211/06*

U.S. Cl. 514—222 **16 Claims**

1. A compound of formula (I)



(I)

or an acid addition salt thereof, wherein

R^1 is hydrogen, hydroxy, alkoxy, cyclic alkoxy, aryloxy or aryl C_{1-6} alkyloxy wherein the aryl moiety is phenyl or naphthyl, or heteroaryloxy or heteroaryl C_{1-6} alkyloxy wherein the heteroaryl moiety is a mono- or fused bicyclic aromatic group containing up to 4 heteroatoms selected from oxygen, nitrogen or sulphur; and

one of R^2, R^3 and R^4 is hydrogen and the others are the same or different and each is hydrogen, alkyl, cyclic alkyl, aryl or aryl C_{1-6} alkyl wherein the aryl group is phenyl or naphthyl or

R^2 is hydrogen and

is mono- or bicyclic amino.

16. A method for treating diarrhoea in human and non-human animals which comprises administering an effective non-toxic amount of a compound of formula (I) as defined in claim **1** to an animal in need thereof.

4,539,320
HUMECTANT COMPOSITIONS CONTAINING THIAMORPHOLINONE OR A DERIVATIVE THEREOF

Gérard Lang, Epinay-sur-Seine; Jean Maignan, Tremblay Les Gonesse; Jean-Luc Leveque, Paris, and Laurent Rasseneur, Thorigny-sur-Marne, all of France, assignors to L'Oreal, Paris, France

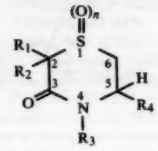
Filed Apr. 13, 1983, Ser. No. 484,604

Claims priority, application France, Apr. 15, 1982, 82 06499

Int. Cl.[3] **A61K** *31/54*

U.S. Cl. 514—222 **3 Claims**

1. A process for imparting suppleness and elasticity to the skin comprising applying to the skin in an amount effective to impart suppleness and elasticity to said skin, a cosmetic composition containing 0.1 to 20 weight percent of a humectant, said humectant being a compound of the formula



wherein

R_1 and R_2 each independently represent hydrogen or lower alkyl having 1–14 carbon atoms,

R_3 represents hydrogen, linear or branched lower alkyl having 1–4 carbon atoms, mono- or polyhydroxyalkyl having 2–16 carbon atoms, carbamylalkyl, carboxyalkyl or alkoxycarbonylalkyl, wherein the alkyl moiety of each has 1–17 carbon atoms and the alkoxy moiety has 1–3 carbon atoms,

R_4 represents hydrogen, lower alkyl having 1–4 carbon atoms or —$COOR_5$ wherein R_5 represents hydrogen, alkyl having 1–18 carbon atoms, alkyl having 1–18 carbon atoms and interrupted by one or more heteroatoms, or mono- or polyhydroxyalkyl having 2–18 carbon atoms, and

n is 0 or 1.

4,539,321
5-DIAZA-ARYL-3-SUBSTITUTED PYRIDONE COMPOUNDS

Henry F. Campbell, Lansdale, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

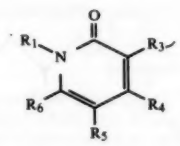
Continuation-in-part of Ser. No. 314,692, Oct. 26, 1981,. This application May 10, 1983, Ser. No. 493,336

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.[3] **A61K** *31/495, 31/505;* **C07D** *237/00, 401/00*

U.S. Cl. 514—252 **18 Claims**

1. A compound according to the formula



wherein:

R_1 is hydrogen, lower alkyl, hydroxyloweralkyl or phenloweralkyl;

R_3 is lower alkyl, cyano, guanidino, thioureido, ureido, carboxyl, lower alkoxy, hydroxyl, hydroxy loweralkyl, loweralkyl acylamino, carbamoyl, carbamoyl guanidino, or cyanoguanidino;

R_4 and R_6 are each independently hydrogen or lower alkyl;

R_5 is a 6 membered ring heteroaryl group including at least two nitrogen atoms and four carbon atoms in the ring; and, wherein:

one of the heteroaryl hydrogen atoms may be substituted by halo, lower alkyl, halo loweralkyl, hydroxy loweralkyl, hydroxy, lower alkylamino, dilower alkylamino, amino, loweralkyl acylamino, lower alkanoyl, cyano or nitro; or a pharmaceutically acceptable salt thereof.

16. A method for increasing cardiac contractility in a human or other mammal which comprises administering thereto an effective cardiotonic amount of a compound according to claim **1**.

4,539,322

DIHYDROPYRIDINE DERIVATIVES AND THEIR USE IN TREATING HEART CONDITIONS AND HYPERTENSION

Simon F. Campbell, Deal; Peter E. Cross, Canterbury, and John K. Stubbs, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

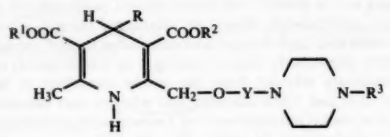
Continuation-in-part of Ser. No. 463,092, Feb. 2, 1983, abandoned. This application Sep. 1, 1983, Ser. No. 528,507

Claims priority, application United Kingdom, Sep. 4, 1982, 8225246; European Pat. Off., Aug. 26, 1983, 83304954.7

Int. Cl.³ A61K *31/495;* **C07D** *401/12*

U.S. Cl. 514—253 **20 Claims**

1. A 1,4-dihydropyridine derivative of the formula:



, or a pharmaceutically acceptable acid addition salt thereof, where

R is aryl or heteroaryl;

R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl;

Y is $—(CH_2)_2—$, $—(CH_2)_3—$, $—CH_2CH(CH_3)—$ or $—CH_2C(CH_3)_2—$;

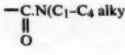
R^3 is hydrogen or is selected from the group consisting of:

(a)

where R^4 is H, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, —COO(C_1–C_4 alkyl), $—CH_2COO(C_1$–C_4 alkyl), aryl, $—SO_2$ aryl, or heteroaryl,

and X is O or S;

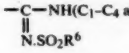
(b)



(c)

where R^5 is 1-pyrrolidinyl, $—NH_2$, —NH(C_1–C_4 alkyl), $—N(C_1$–C_4 alkyl)$_2$, or $—NH(CH_2)_2N(C_1$–C_4 alkyl)$_2$;

(d)

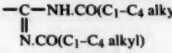


where R^6 is C_1–C_4 alkyl or aryl;

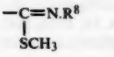
(e)

where R^7 is $—CONH(C_1$–C_4 alkyl) or $—COO(C_1$–C_4 alkyl);

(f)



(g)



where R^8 is —CN, $—SO_2(C_1$–C_4 alkyl) or $—SO_2$ aryl;

(h) $—CH_2CO.R^9$ where R^9 is $—NH_2$, —NH(C_1–C_4 alkyl), —NH.aryl or C_1–C_4 alkoxy;

(i) $—SO_2.R^{10}$ where R^{10} is $—NH_2$, $—N(C_1$–C_4 alkyl)$_2$ or C_1–C_4 alkyl; and

(j) $—CO.R^{11}$ where R^{11} is H, halomethyl, $—COO(C_1$–C_4 alkyl), $—CH_2O(C_1$–C_4 alkyl), $—CH_2CO(C_1$–C_4 alkyl), C_1–C_4 alkyl, C_1–C_4 alkoxy, aryl, heteroaryl, morpholino or 5-oxo-pyrrolidin-2-yl;

wherein the aryl is phenyl; phenyl substituted by one or two substituents selected from the group consisting of nitro, halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, trifluoromethyl, (C_1–C_4 alkoxy)carbonyl and cyano; 1-naphthyl; or 2-naphthyl; and

wherein the heteroaryl is benzofuranyl; benzothienyl; pyridyl; pyridyl substituted by methyl or cyano; quinolyl; benzoxazolyl; benzthiazolyl; furyl; pyrimidinyl; thiazolyl; 2,1,3-benz-oxadiazol-4-yl; 2,1,3-benzthiadiazol-4-yl; thienyl; or thienyl substituted by halo or C_1–C_4 alkyl.

19. A method of treating a heart condition, which comprises administering an effective amount of a compound according to claim **1**.

4,539,323

N-[1-(4-AMINO-6,7-DIALKOXY-2-QUINAZOLINYL)-4-PIPERIDYL]-OXAZOLIDINE-2,4-DIONES

Anton Mentrup, Mainz-Kastel; Ernst-Otto Renth; Kurt Schromm, both of Ingelheim am Rhein; Wolfgang Hoefke, Wiesbaden, and Wolfram Gaida, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Inglheim am Rhein, Fed. Rep. of Germany

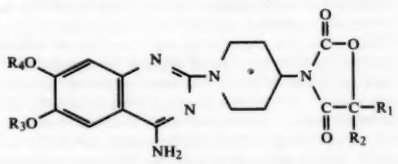
Filed Sep. 14, 1983, Ser. No. 531,842

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1982, 3235565

Int. Cl.³ A61K *31/505;* **C07D** *413/14*

U.S. Cl. 514—260 **5 Claims**

1. A compound of the formula



wherein

R_1 and R_2 are each independently hydrogen, straight or branched alkyl of 1 to 8 carbon atoms or benzyl; or

R_1 and R_2, together with each other, are $—(CH_2)_4—$ or $—(CH_2)_5—$; and

R_3 and R_4 are each independently hydrogen, straight or branched alkyl of 1 to 4 carbon atoms or benzyl; or

R_3 and R_4, together with each other, are $—CH_3—$ or $—CH_2—CH_2$;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. The method of lowering the blood pressure of a warm-blooded animal in need thereof, which comprises perorally or

parenterally administering to said animal an effective hypotensive amount of a compound of claim 1.

4,539,324

SUBSTITUTED PYRIMIDIN-2-ONES AND THE SALTS THEREOF

Tore Benneche; Per Strande, and Kjell Undheim, all of Oslo, Norway, assignors to Nyegaard & Co. A/S, Oslo, Norway

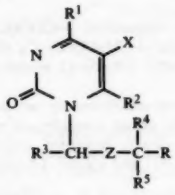
Filed Feb. 24, 1983, Ser. No. 469,232

Claims priority, application United Kingdom, Feb. 24, 1982, 8205483

Int. Cl.[3] **A61K** *31/505;* **C07D** *409/12, 405/12, 239/36*

U.S. Cl. 514—274 **12 Claims**

1. A compound of the formula:



wherein

X represents a halogen atom or a trifluoromethyl group;

R^1 and R^2, independently represent a hydrogen atom or a lower alkyl group;

R^3, R^4 and R^5, which may be the same or different, each represent a hydrogen atom or a lower alkyl, lower alkenyl, lower alkynyl, lower alkanoyl, lower alkenoyl, C_{7-16} phenylalkyl or naphthylalkyl, or a phenyl or naphthyl group or an unsaturated or aromatic heterocyclic ring having 5 or 6 ring members and having 1–3 hetero-atoms; one or both of R^4 and R^5 may also represent phenoyl or naphthoyl groups;

Z represents an oxygen atom or a sulfur atom or oxide thereof or a group NR^6, wherein R^6 is as defined for R hereinafter or represents the group COR^7 in which R^7 represents a hydrogen atom or a phenyl or naphthyl group, a heterocyclic group having 5 or 6 ring members and having 1–3 heteroatoms; phenylalkyl, naphthylalkyl, lower alkyl or lower alkoxy group optionally substituted by one or more substituents selected from halogen atoms, hydroxyl, amino, oxo or C_{1-4} alkyl groups; and

R represents a phenyl or naphthyl group or a 5–6 membered unsaturated or aromatic heterocyclic ring which ring contains 1–3 hetero-atoms selected from O, N and S and optionally carries a fused benzene or naphthalene ring and which phenyl or naphthyl group, heterocyclic or heterocyclic ring carrying a fused benzene or naphthalene ring may carry one or more C_{1-4} alkyl or phenyl groups and any one of said groups or rings being optionally substituted by one or more substituents selected from halogen atoms, optionally substituted hydroxyl, optionally substituted amino, nitro, oxo, sulfonic acid and sulfonamido groups and thioether groups and oxides thereof; and where acid or basic groups are present, the salts thereof.

4,539,325

1-(2-ARYL-2-HALO-1-ETHENYL)-1H-AZOLES, AND ANTICONVULSANT USE THEREOF

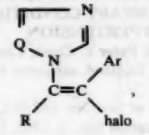
Jan Heeres, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 549,127, Nov. 7, 1983, abandoned. This application Jul. 12, 1984, Ser. No. 630,158

Int. Cl.[3] **A61J** *31/41, 31/415;* **C07D** *233/61, 233/54*

U.S. Cl. 514—283 **12 Claims**

1. A chemical compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a stereochemically isomeric forms thereof, wherein

Q is CH or N;

R is hydrogen, lower alkyl, aryl, aryllower alkyl or halo; and

Ar is aryl;

wherein aryl is phenyl, substituted phenyl, naphthalenyl, substituted naphthalenyl, thienyl or substituted thienyl, wherein said substituted naphthalenyl and substituted thienyl are naphthalenyl, respectively thienyl, having 1 or 2 substituents each independently selected from the group consisting of halo, lower alkyl and lower alkyloxy and wherein said substituted phenyl is phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl, nitro, amino, phenyllower alkyl and a radical R^2, said R^2 being phenyl optionally substituted with halo and/or lower alkyl; provided that not more than one substituent on said substituted phenyl is a radical R^2.

4,539,326

5-OXO-5H-(1)BENZOPYRANO(2,3-b)PYRIDINE DERIVATIVES, THEIR PRODUCTION AND USE AS ANTI-INFLAMMATORY AGENTS

Akira Nohara, Kyoto, and Seiji Kuzuna, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

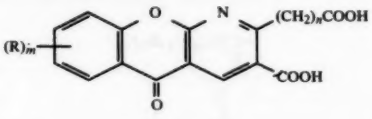
Filed Jul. 5, 1983, Ser. No. 510,723

Claims priority, application Japan, Aug. 20, 1982, 57-145274; May 19, 1983, 58-88915

Int. Cl.[3] **C07D** *491/00, 221/18, 471/00;* **A61K** *31/435*

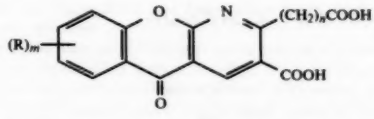
U.S. Cl. 514—285 **27 Claims**

1. A compound of the formula:



wherein R is the same or different and represents hydrogen, C^{1-6}-alkyl, C^{1-4}-alkoxy, nitro, hydroxyl, C^{1-3}-alkyl-CO, C^{1-4}-hydroxyalkyl or halogen where m is 1,2 or 3, or a $—(CH_2)_4—$ or —CH=CH—CH=CH— group which, in conjunction with two adjacent carbon atoms on the ring, forms a six-membered ring where m is 1; and wherein n is 1 or 2, or a physiologically acceptable salt or ester thereof.

3. A pharmaceutical composition for the treatment of connective tissue and inflammatory diseases which contains an amount effective for such treatment of a compound of the formula:



wherein R is the same or different and represents hydrogen, C^{1-6}-alkyl, C^{1-4}-alkoxy, nitro, hydroxyl, C^{1-3}-alkyl CO, C^{1-4}-hydroxyalkyl or halogen where m is 1, 2 or 3, or a $—(CH_2)_4—$ or —CH=CH—CH=CH— group which, in conjunction

with two adjacent carbon atoms on the ring, forms a six-membered ring where m is 1; and wherein n is 1 or 2, or a physiologically acceptable salt or ester thereof and a pharmaceutically acceptable carrier.

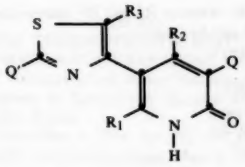
4,539,327

5-(2-SUBSTITUTED-4-THIAZOLYL)-6-ALKYL-2(1H)-PYRIDINONES AND CARDIOTONIC USE THEREOF

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 411,558, Aug. 25, 1982, Pat. No. 4,469,699.
This application Jan. 16, 1984, Ser. No. 571,281
Int. Cl.³ C07D *401/04;* A61K *31/44*
U.S. Cl. 514—342 **6 Claims**

1. 3-Q-4-R_2-5-(2-Q'-5-R_3-4-thiazolyl)-6-R_1-2(1H)-pyridinone having the formula



where R_1 is alkyl having one to four carbon atoms, R_2 is hydrogen or methyl, R_3 is hydrogen or alkyl having from one to three carbon atoms, Q is amino, carbamyl, carboxy or hydrogen, and Q' is alkyl having from one to four carbon atoms, amino or R_4NH where R_4 is alkyl having one to four carbon atoms; or an acid-addition salt thereof where at least one of Q and Q' is amino or Q' is R_4NH.

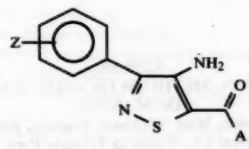
4,539,328

NEMATICIDAL ISOTHIAZOLE DERIVATIVES

William S. DiMenna, East Amherst, N.Y., and David M. Floyd, Pennington, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 25, 1983, Ser. No. 478,959
Int. Cl.³ C07D *275/02;* A01N *43/80*
U.S. Cl. 514—372 **1 Claim**

1. A method of controlling nematodes which comprises applying to or incorporating into nematode-infested soil a nematicidally effective amount of a nematicidal composition containing in admixture with an agriculturally acceptable carrier at least one nematicidal compound of the formula



wherein

A is selected from hydroxy, lower alkoxy, phenylmethoxy, and —NHR, where R is hydrogen, straight chain alkyl of 1–4 carbon atoms, 2-hydroxyethyl or 2-acetyloxyethyl; and

Z is selected from hydrogen, halogen, lower alkyl, straight or branched chain alkoxy of 1–4 carbon atoms, difluoromethoxy, thiomethyl, nitro, amino, and phenyl; with the proviso that Z is not 2-bromo or 4-nitro when A is ethoxy.

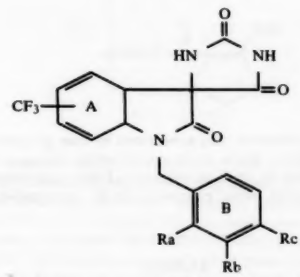
4,539,329

7'-TRIFLUOROMETHYL-SPIRO[IMIDAZOLIDINE-4,3'-INDOLINE]-2,2',5-TRIONES AS ALDOSE REDUCTASE INHIBITORS

David R. Brittain; David Brown, both of Macclesfield, and Robin Wood, Stockport, all of England, assignors to Imperial Chemical Industries, plc, Great Britain

Filed May 6, 1983, Ser. No. 492,221
Claims priority, application United Kingdom, May 11, 1982, 8213651; Nov. 1, 1982, 8231129
Int. Cl.³ A61K *31/415;* C07D *487/10*
U.S. Cl. 514—389 **9 Claims**

1. A compound selected from the group consisting of trifluoromethyl spiro[imidazolidine-4,3'-indoline]-2,2',5-trione of the formula I



I

wherein the trifluoromethyl substituent in benzene ring A is located at the 7' position; and benzene ring B is dihalogenophenyl wherein Ra is fluoro or chloro, Rb is hydrogen and Rc is chloro, bromo or iodo; or Ra is hydrogen and Rb and Rc are independently chloro or bromo; and a salt with a base affording a pharmaceutically acceptable cation.

9. A method of inhibiting the enzyme aldose reductase in a warm blooded animal requiring such treatment which comprises administering to said animal an aldose reductase inhibitory amount of a compound according to claim 1.

4,539,330

IMIDAZOLIDINYL UREA AND DERIVATIVES THEREOF FOR USE IN OPTHALMIC SOLUTIONS

Seymour F. Trager, Plainview, N.Y., and Victoria S. Chylinski, Stroud, England, assignors to Ketchum & Co. Inc., Westport, Conn.

Continuation of Ser. No. 477,847, Mar. 22, 1983, abandoned.
This application Oct. 24, 1984, Ser. No. 664,926
Int. Cl.³ A61K *31/415*
U.S. Cl. 514—398 **5 Claims**

1. A process for imparting anti-microbial properties to an ophthalmic solution containing an opthalmically active ingredient comprising adding to said ophthalmic solution material an anti-bacterially effective amount of a urea derivative selected from the group consisting of imidazolidinyl urea and N-(hydroxymethyl)-N-(1, 3-dihydroxymethyl-2, 5-dioxy-4-imidazolidinyl)-N'-(hydroxymethyl)urea.

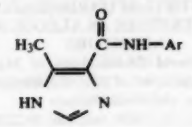
4,539,331

IMIDAZOLE CARBOXAMIDE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS THEREOF

José M. Calderó Ges, and Antonio P. Duena, both of Barcelona, Spain, assignors to Laboratorios Vita, S.A., Barcelona, Spain

Continuation of Ser. No. 330,960, Dec. 15, 1981, abandoned.
This application Feb. 21, 1984, Ser. No. 581,651
Claims priority, application Spain, Apr. 16, 1981, 502162
Int. Cl.³ A61K *31/415;* C07D *233/90*
U.S. Cl. 514—400 **15 Claims**

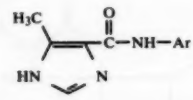
1. Imidazole derivatives of the general formula I



(I)

where Ar is a benzene ring substituted by one or more of the following groups, alone or in combination: halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl and nitro.

9. A pharmaceutical composition with analgesic, antipyretic and antiinflammatory activity wherein the composition contains as active ingredient a therapeutically effective amount of one of the imidazole derivatives of the general formula I



(I)

where Ar is a benzene ring substituted by one or more of the following groups, alone or in combination: halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl and nitro, associated with excipients and/or other pharmaceutically acceptable active substances.

4,539,332

2,5-DIARYL TETRAHYDROFURANS AND ANALOGS THEREOF AS PAF-ANTAGONISTS

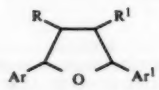
Tesfaye Biftu, Westfield; San-Bao Hwang, Scotch Plains; Thomas W. Doebber, Scotch Plains; Thomas R. Beattie, Scotch Plains, and Tsung-Ying Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 14, 1983, Ser. No. 551,666

Int. Cl.[3] **A61K** *31/34;* **C07D** *307/06, 307/12*

U.S. Cl. 514—461 **9 Claims**

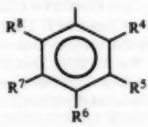
1. A compound of formula:



wherein R and R′ independently are

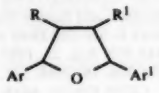
(a) hydrogen:
(b) haloloweralkyl;
(c) halo;
(d) $CONR^2R^3$ wherein R^2 and R^3 independently represent C_{1-6} alkyl and hydrogen;
(e) loweralkenyl;
(f) $—COR^2$;
(g) $—CH_2OR^2$;
(h) loweralkynyl;
(i) $—CH_2NR^2R^3$;
(j) $—CH_2SR^2$;
(k) =O; or
(l) $—OR^2$;

Ar and Ar^1 are the same or different from each other and are substituted phenyl of formula



where R^4–R^8 independently represent $R^2O—$, $R^2S—$, R^2SO, $R^2SO_2—$, $CF_3O—$, $CF_3S—$, $R^2R^3N—$, $—OCH_2CO_2R^2$, $—SO_2NR^2R^3$, $—CO_2R^2$, $—NR^2SO_2R^3$, COR^2, NO_2, or CN or R^4–R^5, R^5–R^6, R^6–R^7 and R^7–R^8 are joined together forming a bridge.

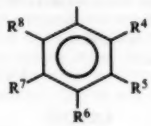
7. A method for the treatment of a disease or a disorder mediated by PAF comprising administering to a mammalian species in need of the treatment a therapeutically effective amount of a compound of formula:



wherein R and R′ independently are

(a) hydrogen:
(b) haloloweralkyl;
(c) halo;
(d) $CONR^2R^3$ wherein R^2 and R^3 independently represent C_{1-6} alkyl and hydrogen;
(e) loweralkenyl;
(f) $—COR^2$;
(g) $—CH_2OR^2$;
(h) loweralkynyl;
(i) $—CH_2NR^2R^3$;
(j) $—CH_2SR^2$;
(k) =O; or
(l) $—OR^2$;

Ar and Ar^1 are the same or different from each other and are phenyl or substituted phenyl of formula



where R^4–R^8 independently represent H, $R^2O—$, $R^2S—$, R^2SO, $R^2SO_2—$, $CF_3O—$, $CF_3S—$, $R^2R^3N—$, $—OCH_2CO_2R^2$, $—SO_2NR^2R^3$, $—CO_2R^2$, $—NR^2SO_2R^3$, COR^2, NO_2, or CN or R^4–R^5, R^5–R^6, R^6–$R^7$and R^7–R^8 are joined together forming a bridge.

4,539,333

PROSTACYCLIN, METHODS OF USING AND METHOD OF MAKING

Salvador Moncada, West Wickham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed May 10, 1977, Ser. No. 795,524

Claims priority, application United Kingdom, May 11, 1976, 19384; Aug. 17, 1976, 34151; Sep. 3, 1976, 36547

Int. Cl.[3] **C12P** *31/00;* **A61K** *31/557;* **C07D** *307/935*

U.S. Cl. 514—469 **9 Claims**

1. Prostacyclin substantially free from other biological material.

8. The method of preparing (5-Z)-5,6-Didehydro-9-deoxy-6,9α-epoxyprostaglandin $F_{1\alpha}$ which comprises incubating microsomes of mammalian tissue with a prostaglandin endoperoxide.

4,539,334
SELECTIVE POISONING OF FISCHER-TROPSCH CATALYSTS

Craig B. Murchison, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 14, 1983, Ser. No. 550,852
Int. Cl.³ C07C 1/04
U.S. Cl. 518—717 15 Claims

1. A Fischer-Tropsch process comprising contacting hydrogen and carbon monoxide in the presence of a conventional Fischer-Tropsch catalyst in combination with an amount of phosphorus in the absence of halogen effective to improve the selectivity of the catalyst to C_2–C_4 olefins by adding a volatile phosphorus compound to the carbon monoxide and hydrogen reactants.

4,539,335
EXPANDABLE THERMOPLASTIC RESIN PARTICLES AND PROCESS FOR PREPARING THE SAME

Kiyoshi Mori, Kakogawa, and Masao Nakagawa, Kobe, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 4, 1984, Ser. No. 607,261
Claims priority, application Japan, May 6, 1983, 58-79645
Int. Cl.³ C08J 9/18
U.S. Cl. 521—60 9 Claims

1. An expandable thermoplastic resin particle comprising a thermoplastic resin and 2 to 15% by weight of an expanding agent, said thermoplastic resin being prepared by suspension-polymerizing 10 to 80% by weight of α-methylstyrene, 5 to 50% by weight of acrylonitrile and 0 to 70% by weight of at least one other monomer selected from the group consisting of styrene, methyl methacrylate, vinyl toluene and t-butystyrene in the presence of a difunctional organic peroxide as an initiator at a temperature of 80° to 130° C.

4,539,336
MODIFIED POLYIMIDE/POLYIMIDE-AMIDE FOAMS AND METHODS OF MAKING SAME

John V. Long, 1756 E. Lexington Ave., El Cajon, Calif. 92021, and John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120

Filed Dec. 6, 1984, Ser. No. 678,992
Int. Cl.³ C08J 9/02
U.S. Cl. 521—77 23 Claims

1. The method of making a resilient, flame resistant modified polyimide foam having a selected compressive resistance which comprises the steps of:

providing an aromatic dianhydride;

mixing these with an agent selected from oxoimines, amino acids and mixtures thereof;

the mole ratio of said agent to dianhydride between about 1.5:1 and just above 0:1;

mixing therewith a suitable quantity of an alcohol;

heating the mixture to a temperature of about 60° C. to 120° C. for 30 to 90 minutes to produce an ester;

adding thereto a diamine;

drying the resulting solution; and

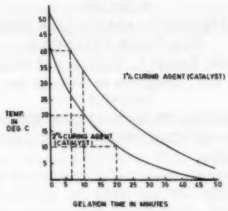
heating the dry material to a selected foaming temperature of from about 120° C. to about 320° C. for a period of from about 10 to about 60 minutes;

whereby a resilient foam having a selected compressive resistance in accordance with the selected oxoimine to dianhydride mole ratio, the compressive resistance being inversely proportional to the oxoimine quantity.

4,539,337
BACKING MATERIAL

John C. B. Blore, 14 Cumberland Ave., Randburg, Transvaal, South Africa

Continuation-in-part of Ser. No. 406,282, Aug. 9, 1982,. This application Mar. 22, 1984, Ser. No. 592,603
Claims priority, application South Africa, Aug. 14, 1981, 81/5616
Int. Cl.³ C08J 9/10
U.S. Cl. 521—89 11 Claims



1. A material especially adapted for use as a backing for the wearing parts of machines consisting essentially of:

a phthallic polyester resin consisting essentially of about 36–38 wt. % orthophthallic anhydride, about 21–26 wt. % maleic anhydride, and about 43–36% propylene glycol and a flexibilizing agent consisting essentially of about 30 wt. % styrene monomer and about 70 wt. % of a prepolymer consisting essentially of about 15–35 wt. % phthalic acid, about 15–5 wt. % adipic acid, about 20–30 wt. % other dibasic acid, and about 50–30 wt. % of a member from the group consisting of bis-phenol A, prodendro bis-phenol A, and mixtures thereof selected from the group consisting of bis-phenol A polyester resins and prodendro bis-phenol A polyester resins, the weight ratio of phthallic polyester resin to flexibilizing agent being between 1.65 and 5.0,

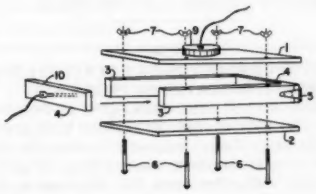
an expansion agent present in an amount to compensate for the shrinkage of the polyester resin and flexibilizing agent during curing, and

a filler present in an amount which can be wetted by the resin and flexibilizing agent.

4,539,338
PHENOL FORMALDEHYDE RESOLES FOR MAKING PHENOLIC FOAM

John D. Carlson, Homosassa, Fla.; Edward W. Kifer, Trafford, Pa.; Vincent J. Wojtyna, Lyndora, Pa., and James P. Colton, Monroeville, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 396,500, Jul. 9, 1982, abandoned, which is a continuation-in-part of Ser. No. 282,021, Jul. 10, 1981, abandoned. This application Jul. 27, 1984, Ser. No. 634,197
Int. Cl.³ C08J 9/14
U.S. Cl. 521—131 30 Claims



1. An improved process for preparing closed cell phenolic foam having entrapped fluorocarbon blowing agent comprising preparing a foamable phenolic resole composition compris-

ing aqueous phenol formaldehyde resole, surfactant, fluorocarbon blowing agent and acid catalyst, and foaming and curing said composition in a substantially closed mold wherein the improvement comprises a phenol formaldehyde resole having a molar ratio of formaldehyde to phenol of from about 1.7:1 to about 2.3:1, a weight average molecular weight greater than about 800, a number average molecular weight greater than about 350, a dispersivity greater than about 1.7 and wherein the content of free formaldehyde and free phenol are each less than 7 percent by weight.

4,539,339

POLYURETHANE FOAMS MADE FROM VINYL POLYMER POLYOLS

Michael Cuscurida; Ernest L. Yeakey, and Bruce W. Peterson, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 27, 1984, Ser. No. 654,904
Int. Cl.³ C08G *18/14, 18/63, 18/48*
U.S. Cl. 521—137 **14 Claims**

1. A polyurethane foam being produced by the process comprising

reacting a vinyl polymer polyol together with an organic polyisocyanate in the presence of a polyurethane catalyst and optionally in the presence of a blowing agent,

wherein the vinyl polymer polyol is prepared by the process comprising polymerizing via a free radical reaction a monomer component consisting of at least one vinyl monomer in the presence of an epoxy resin-modified polyol.

4,539,340

HALF-ESTER ADDUCTS AND POLYMER-POLYOLS USEFUL IN THE PREPARATION OF IMPROVED PLASTICS, INCLUDING POLYURETHANE FOAMS, ELASTOMERS AND THE LIKE

Paul Stamberger, Baltimore, Md., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 279,264, Jul. 1, 1981, abandoned. This application Jun. 6, 1983, Ser. No. 501,125
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—157 **11 Claims**

1. A polyurethane which is the reaction product of a mixture comprising an organic polyisocyanate and the polymer-polyol comprising a mixture of:

(A) a minor percentage by weight of a half-ester adduct formed by reaction of a first polyol with a co-reactant selected from the group consisting of dibasic carboxylic acids, dibasic carboxylic anhydrides and mixtures thereof,

in which a substantial percentage of the carboxylic carbon atoms of the co-reactant remain unreacted after reaction with the polyol, the KOH equivalent of the half-ester adduct being in the range from about 4 to about 16 milligrams per gram;

(B) a second polyol; and

(C) at least one ethylenically unsaturated monomer which is reactive with free hydroxyl groups of the first and second polyols,

in which (C) has been polymerized in (A) and (B) by free radical addition polymerization to a substantially linear polymer having a molecular weight of at least about 5,000 to provide a liquid, stable dispersion of polymer-polyol.

4,539,341

DIGESTION PRODUCTS OF POLYALKYLENE TEREPHTHALATE POLYMERS AND POLYCARBOXYLIC ACID-CONTAINING POLYOLS AND POLYMERIC FOAMS OBTAINED THEREFROM

Richard K. Hallmark, Largo; Michael J. Skowronski, Clearwater, and William D. Stephens, Pinellas Park, all of Fla., assignors to Jim Walter Resources, Inc., Birmingham, Ala.

Filed Feb. 22, 1984, Ser. No. 582,348
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—172 **52 Claims**

1. A polyisocyanurate foam comprising the reaction product of an organic polyisocyanate, a blowing agent, a trimerization catalyst, and a minor amount of a polyol, wherein from about 5 to 100 weight percent of the Polyol comprises the reaction product obtained by digesting polyalkylene terephthalate with a digesting medium comprising a polycatboxylic acid component-containing polyol derived from the polycarboxylic acid component and a digesting polyol component, wherein the polycarboxylic acid component has ring units with two

groups on adjacent of alternate ring positions, the ring unit content of the polycarboxylic acid component being sufficient for improved storage stability of the digestion product.

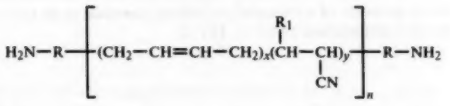
4,539,342

POLYIMIDE FOAM PREPARED FROM AMINO TERMINATED BUTADIENE ACRYLONITRILE REACTANT

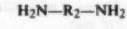
Raymond Lee, Elk Grove Village; David W. Okey, Downers Grove, and Gregory A. Ferro, Mt. Prospect, all of Ill., assignors to IMI-Tech Corporation, Elk Grove Village, Ill.

Filed Apr. 3, 1984, Ser. No. 596,298
Int. Cl.³ C08J *9/02*
U.S. Cl. 521—189 **9 Claims**

1. A polyimide foam prepared from a polyamide-acid/ester prepolymer synthesized by reaction of an organic tetracarboxylic acid ester derivative with (a) 0.05 to 7.5 mole % of at least one liquid diamine selected from the group consisting of a polymer having the formula:



wherein R is either a phenylene group or an alkylene group, R_1 is hydrogen or methyl, n is an integer preferably below 20 and x and y are each independent integers ranging from 1 to 25 and (b) an aromatic diamine having the formula:



wherein R_2 is an aromatic group containing 5 to 16 carbon atoms.

4,539,343

REFRACTORY MATERIAL

Toshiaki Nishimura, Fujieda, Japan, assignor to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,927
Claims priority, application Japan, Mar. 25, 1983, 58-49014
Int. Cl.³ C08K *3/22, 3/38;* **C08L** *61/06;* **C21B** *7/06*
U.S. Cl. 523—145 **9 Claims**

1. A refractory composition consisting essentially of basic refractory aggregates consisting primarily of magnesium oxides, calcium oxides and mixtures thereof, phenolic resin, hexamethylene tetramine and a compound having a pKa less than 9.5 at 25° C., said phenolic resin is added to 5000 parts by weight of aggregate in an amount from about 150 to about 750 parts by weight and said compound from about 2 to about 230 parts by weight.

4,539,344

THERMALLY STABLE SEALANT COMPOSITION

Joel V. Van Ornum, Kirkland, and Jessie T. Chiu, Bellevue, both of Wash., assignors to Rockcor, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 298,137, Aug. 31, 1981, abandoned, which is a continuation of Ser. No. 156,125, Jun. 3, 1980, abandoned, which is a continuation of Ser. No. 949,451, Oct. 10, 1978, abandoned. This application Apr. 14, 1982, Ser. No. 368,273

Int. Cl.[3] B60C *21/00*

U.S. Cl. 523—166 30 Claims

1. A butyl rubber-based sealant composition, the butyl rubber constituent of which is present only in the form of a copolymer having a viscosity average molecular weight in excess of 100,000, comprising the reaction product of said butyl rubber, a quinoid cross-linking agent and a cross-linking activator present in an amount sufficient to initiate a reaction between the butyl rubber and the cross-linking agent, and further including at least 1% by weight of zinc oxide, a sulfur constituent present in an amount equivalent to at least 0.5 parts of sulfur per hundred parts butyl rubber, and at least one tackifier compatible with butyl rubber, said butyl rubber comprising 13—30% by weight of the composition exclusive of the cross-linking system and sulfur constituent, such sealant composition being characterized in that, when applied to the interior surface of a tire in a layer at least 0.15 inches thick the tensile strength, elongation and cross-link density of the composition are such that the composition will bridge up to a 0.203 inch hole in a tire inflated to 32 psig at ambient temperature, adhere to a 0.18 inch diameter nail inserted through the tire and sealant layer with the nail being swung through a 90° arc, maintain an air seal about the hole caused by such nail both before and after the nail is withdrawn from the tire, and remain in a non-flow condition at temperatures up to 220° F., under forces encountered during normal tire usage.

4,539,345

MOISTURE-CURABLE POLYURETHANE COMPOSITION

Dennis D. Hansen, Luck, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 4, 1985, Ser. No. 697,831

Int. Cl.[3] C08L *75/00*

U.S. Cl. 523—219 18 Claims

1. A one-part moisture-curable polyurethane composition, comprising a substantially uniform mixture of isocyanate-functional prepolymer, and effective amount of terpene-phenolic resin, and an effective amount of silane compound.

4,539,346

BINDER FOR CHEMICAL AGENTS

Michael R. Ambler, Stow; Richard R. Lattime, and Edward Wanca, both of Tallmadge, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 22, 1984, Ser. No. 592,192

Int. Cl.[3] C08J *3/20*; C08K *5/39, 5/47*; C08L *51/04*

U.S. Cl. 523—332 20 Claims

1. A bound rubber chemical composition comprised of (a) from 1 to 20 weight percent of a blend of (1) from 50 to 90 weight percent of a graft copolymer of from 55 to 90 weight percent of at least one diolefin monomer and of from 10 to 45 weight percent of at least one vinyl aromatic monomer wherein said graft copolymer has a backbone which is derived from at least one diolefin monomer with sidechains which are derived from at least one vinyl aromatic monomer and (2) from 10 to 50 weight percent of a random copolymer of from 70 to 96 weight percent of at least one vinyl aromatic monomer and from 4 to 30 weight percent of at least one diolefin monomer, and (b) from 80 to 99 weight percent of at least one particulate solid chemical agent.

13. A process for producing a bound chemical composition comprising: (1) coagulating a latex comprised of (a) from 50 to 90 weight percent based upon total polymers of a graft copolymer of from 55 to 90 weight percent of at least one diolefin monomer and of from 10 to 45 weight percent of at least one vinyl aromatic monomer wherein said graft copolymer has a backbone which is derived from at least one diolefin monomer with side chains which are derived from at least one vinyl aromatic monomer, (b) from 10 to 50 weight percent based upon the total polymers of a random copolymer of from 70 to 96 weight percent of at least one vinyl aromatic monomer and from 4 to 30 weight percent of at least one diolefin monomer, (c) water, and (d) a soap; in the presence of at least one particulate solid chemical agent to produce a coagulum with the chemical agent dispersed throughout; (2) dewatering the coagulum; (3) extruding the coagulum; and (4) drying the coagulum to form said bound chemical composition.

4,539,347

NOVOLAC BASED EPOXY RESIN CURING AGENTS FOR USE IN AQUEOUS SYSTEMS

William J. DeGooyer, Louisville, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,581

Int. Cl.[3] C08G *59/50*; C08L *63/02*

U.S. Cl. 523—404 22 Claims

1. A novolac based epoxy resin curing agent comprising a volatile acid salt of the reaction product of an epoxy novolac compound and a primary amine containing polyamine wherein substantially all of the epoxy groups are reacted with the polyamine and wherein substantially at least all of the unreacted primary amine groups in the polyamine/epoxide reaction product are reacted with a monoepoxide or a monocarboxylic acid.

4,539,348

WATER-SWELLABLE CROSSLINKED POLYMERIC MICROGEL PARTICLES AND AQUEOUS DISPERSIONS OF ORGANIC FILM-FORMING RESINS CONTAINING THE SAME

Chandrasen Gajria, Louisville, Ky., and Yehuda Ozari, Arcadia, Calif., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 449,887, Dec. 16, 1982, abandoned. This application Jan. 14, 1985, Ser. No. 691,305

Int. Cl.[3] C08K *3/20*

U.S. Cl. 523—409 10 Claims

1. A stable aqueous dispersion of organic, water-dispersible film-forming resin, comprising:

a. at least one water-dispersible, film forming resin dissolved in an organic water-miscible solvent wherein the film-forming resin is selected from the group consisting of heat-curable, thermosetting epoxy resins, phenolic resins, alkyd resins, polyester resins, aminoplast resins and mixtures thereof and wherein the organic solvent has a boiling point of about 150° F. to about 500° F.;

b. a dispersing amount of an aqueous solvent medium; and

c. from about 10 to 50% by weight, based on the total solids weight of the dispersion, of a stabilizer for stabilizing said film-forming resin in said aqueous solvent medium, said stabilizing comprising crosslinked, aqueous emulsion polymerized microgel particles comprising the addition copolymerization product of:

(i) a major amount of at least one polymerizable carboxylic acid group-free polymerizable vinyl monomer selected from the group consisting of polymerizable vinyl aromatic monomers, methacrylate ester monomers, nitrile monomers, vinyl halide monomers, mixtures thereof, and mixtures thereof with minor amounts of vinyl ester monomers and alkyl acrylate monomers,

(ii) from about 10–50%, based on the total monomer weight, of at least one polymerizable vinyl monomer selected from the group consisting of α, β-ethylenically unsaturated carboxylic acid monomers and mixtures thereof, said carboxylic acid monomers being substantially non-gelling

when copolymerized with said acid group-free monomers in an aqueous emulsion, and

(iii) from a small amount sufficient to cross-link the microgel particle up to about 5%, based on the total monomer weight, of a difunctional crosslinking monomer having at least two polymerizable double bonds,

said microgel particles being water-swellable, exhibiting a stability in aqueous media of at least about one week when an aqueous dispersion of said microgel particles of about 20% solids content is maintained at 140° F., and having further the acid groups thereof at least partially neutralized with ammonia or a volatile organic amine in an amount sufficient to provide a pH of about 2 to about 10 to said aqueous dispersion.

4,539,349

UNSATURATED POLYESTER COMPOSITIONS COMPRISING CARBOXYLATED CELLULOSE ESTER

William W. Blount, Surgoinsville, and William M. Robinette, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,349

Int. Cl.³ C09D *3/14*; C08L *1/04, 1/26*

U.S. Cl. 523—509 **28 Claims**

1. An unsaturated polyester composition which comprises:

(A) an unsaturated polyester which comprises the reaction product of (i) a diacid component which comprises at least about 50% by weight of an ethylenically unsaturated dicarboxylic acid and (ii) a diol component;

(B) a reactive solvent for said unsaturated polyester; and

(C) at least about 0.5% by weight, based upon the total weight of the composition, of a carboxylated cellulose ester selected from carboxylated cellulose acetate, carboxylated cellulose propionate, carboxylated cellulose butyrate, carboxylated cellulose acetate propionate, carboxylated cellulose acetate butyrate, or a mixture thereof.

4,539,350

HIGH IMPACT, HIGH MODULUS FIBER REINFORCED LINEAR POLYESTER

Petrus C. A. M. V. Abeelen, Gilze; Jan Bussink, Bergen op Zoom, and Jean M. H. Heuschen, Ha Halsteren, all of Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Filed Jul. 9, 1981, Ser. No. 281,725

Int. Cl.³ C08K *3/40*

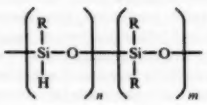
U.S. Cl. 523—527 **5 Claims**

1. A high impact strength, high modulus thermoplastic composition comprising, per 100 parts by weight (a), (b) and (c), an intimate admixture of:

(a) from about 35 to about 95 parts by weight of a linear polyester;

(b) from about 5 to about 65 parts by weight of a fibrous reinforcing agent essentially free of any sizing agent said fibrous reinforcing agent being selected from the group consisting of glass fibers or rockwool fibers; and

(c) from about 0.05 to about 4 parts by weight of a hydrogen siloxane comprising units of the formula



wherein R is hydrogen, C_1–C_{10} alkyl phenyl, or a mixture of any of the foregoing, and n plus m is at least about 4.

4,539,351

SILICONE RESIN COATING COMPOSITION WITH IMPROVED SHELF LIFE

William J. O'Malley, Killington, Vt., and Howard A. Vaughn, Jr., Schenectady, N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 343,345, Jan. 27, 1982, abandoned. This application Jan. 17, 1985, Ser. No. 692,858

Int. Cl.³ C08L *1/28, 5/00, 83/00*

U.S. Cl. 524—43 **29 Claims**

1. An aqueous coating composition having improved room temperature shelf life comprising a dispersion of colloidal silica in an aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition adjusted to 10 to 15 weight percent solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate by dilution with an aliphatic alcohol or mixture of alcohols, said composition further containing from about 75 to about 750 ppm by weight of a thickening agent, said composition having a pH of 7.1 to about 7.8.

4,539,352

INJECTION-MOLDABLE THERMOPLASTIC POLYESTER COMPOSITION

James Y. J. Chung, New Martinsville, W. Va.; Jesse D. Jones, and Hsueh M. Li, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 513,677, Jul. 14, 1983, Pat. No. 4,486,561, Continuation-in-part of Ser. No. 294,980, Aug. 21, 1981, abandoned, and Ser. No. 392,221, Jun. 25, 1982, abandoned, and Ser. No. 401,929, Jul. 26, 1982, abandoned. This application Aug. 15, 1984, Ser. No. 640,872

Int. Cl.³ C08K *5/15*; C08L *67/02*

U.S. Cl. 524—109 **8 Claims**

1. A thermoplastic composition which is injection-moldable at a relatively low mold temperature, said composition comprising an intimate admixture of:

(a) a polyethylene terephthalate; and

(b) an epoxidized unsaturated triglyceride containing at least one epoxide group and in which each of the acid constituents contains from about 6 to about 30 carbon atoms and in which at least one such acid constituent is epoxidized; and

(c) a nucleating agent cooperative with the epoxidized unsaturated triglyceride of (b) to improve the releasability from the injection mold, of articles injection molded from said composition at mold temperatures of 93° C. or below.

4,539,353

AQUEOUS COMPOSITION OF POLYMALEIC ACID, SURFACTANTS AND COMPLEXING AGENTS, AND ITS PREPARATION AND USE AS AN ASSISTANT IN THE PRETREATMENT OF CELLULOSE-CONTAINING FIBRE MATERIALS

Heinz Abel, Reinach, and Christian Guth, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 13, 1984, Ser. No. 570,710

Claims priority, application Switzerland, Jan. 25, 1983, 397/83

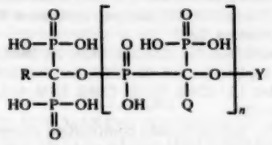
Int. Cl.³ C08K *5/53*

U.S. Cl. 524—123 **9 Claims**

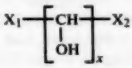
1. An aqueous composition which contains

(a) hydrolyzed polymaleic anhydride and/or its salt,

(b) a complexing agent of the formula



in which Y is hydrogen or —COT, R, Q and T are each alkyl having 1 to 4 carbon atoms, and n is 1 to 16, and/or of the formula



in which X_1 and X_2, independently of each other, are each $—CH_2OH$, —CHO or $—CO_2M$ wherein M is hydrogen or an alkali metal, and x is 2 to 5 and (c) a non-ionic surfactant, an anionic surfactant or a mixture of a non-iionic and an anionic surfactant.

8. A composition according to claim 1, which contains an oxidising agent as a further component (e).

4,539,354

STABILIZED ETHYLENE/CHLOROTRIFLUOROETHYLENE COPOLYMER COMPOSITION

Daniel C. Chung, Bridgewater, and Swayambu Chandrasekaran, Mountain Lakes, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

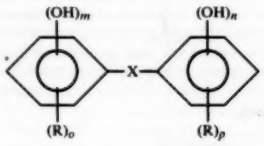
Filed Jul. 6, 1981, Ser. No. 280,730

Int. Cl.³ C08K *5/52*

U.S. Cl. 524—128 **33 Claims**

1. A copolymer composition having improved thermal stability which comprises an admixture of an ethylene/chlorotrifluoroethylene copolymer containing about 40 to about 60 mol percent of ethylene units and about 40 to about 60 mol percent of chlorotrifluoroethylene units, and

(a) 0.01 percent to 3 percent by weight of the polymer of a transesterified reaction product obtained from an organic polyhydric phenol selected from the group consisting of 1,1,3-tri(2-methyl-4-hydroxy-5-tert-butyl phenyl)butane and the phenol of the formula

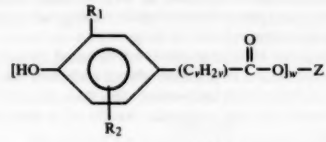


(I)

wherein X is selected from the group consisting of oxygen, sulfur, alkylene, alicyclidene, arylidene and mixed alkylene-arylidene and alkylene-alicyclidene groups, wherein the aliphatic or cycloaliphatic portion of the molecule may be straight chain or branched chain, having from 1 to about 18 carbon atoms; wherein the R substituents, which may be the same or different, are independently selected from the group consisting of hydrogen and alkyl, straight or branched chain, having from 1 to about 18 carbon atoms; and wherein m and n are integers from 1 to 5, and o and p are integers from 0 to 4, with the proviso that the sums of m+o, and n+p may not exceed 5, and an organic phosphite triester free from phenolic hydroxyl groups having up to about 60 carbon atoms obtained by transesterification of the phenol and phosphite at an elevated temperature sufficient to form a homogeneous mixture;

(b) 0.01 percent to 10.0 percent by weight of the polymer of a salt of a monocarboxylic acid having from 6 to about 24 carbon atoms and a metal of Group II of the Periodic Table; and

(c) 0.01 percent to 3.0 percent by weight of the polymer of the ester of a (4-hydroxy-5-alkylphenyl)alkanoic acid, the ester having the formula:



wherein

R_1 is methyl, ethyl or an alpha-branched group of from 3 to 10 carbon atoms;

R_2 is hydrogen, methyl, ethyl or an alpha-branched alkyl group of from 3 to 10 carbon atoms;

v has a value of from 1 to 6;

w has a value of from 2 to 6; and

Z is an aliphatic hydrocarbon of the formula:

C_yH_{2y+2-w}

in which y has a value of from 2 to 18 when w is 2 and a value of from 3 to 6 when w is greater than 2, the value of y in all cases being equal to or greater than that of w.

4,539,355

PHOSPHORUS-CONTAINING COMPOUNDS, THEIR PRODUCTION AND THEIR USE AS ANTIOXIDANTS

Yukoh Takahashi; Shinichi Yachigo, both of Toyonaka, and Tamaki Ishii, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

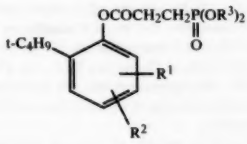
Filed Jun. 16, 1983, Ser. No. 504,782

Claims priority, application Japan, Jun. 23, 1982, 57-108714; Mar. 14, 1983, 58-42868

Int. Cl.³ C07F *9/36;* **C08K** *5/53*

U.S. Cl. 524—131 **7 Claims**

1. A phosphorus-containing compound represented by the formula (1),



(I)

wherein R^1 and R^2 are each a hydrogen atom or a lower alkyl group, and R^3 is a lower alkyl or phenyl group.

3. A method of stabilizing an organic resin subject to deterioration by heat, light or oxygen, by adding to said organic resin, a stabilizing amount of the phosphorus-containing compound of claim 1.

4,539,356

POLYETHYLENE TEREPHTHALATE MOLDING COMPOSITION

Suzanne B. Nelsen, Bergenfield, N.J., assignor to GAF Corporation, Wayne, N.J.

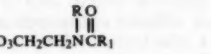
Filed Oct. 17, 1984, Ser. No. 661,743
Int. Cl.³ C08K 5/42; C08L 67/02
U.S. Cl. 524—166 **8 Claims**

1. Polyethylene terephthalate molding composition comprising a blend of:

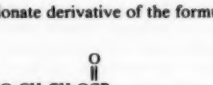
(a) at least about 40 wt % based on total molding composition of polyethylene terephthalate having an intrinsic viscosity of at least about 0.4 dl/g;

(b) between about 0.1 and about 15 wt % based on polyethylene terephthalate of aliphatic glycol phthalate polymer having a polymer melt temperature less than about 150° C. and a number average molecular weight of at least about 1000; and

(c) between about 0.5 and about 10 wt % based on polyethylene terephthalate of alkali metal taurate derivative of the formula



or alkali metal isethionate derivative of the formula:



where X represents alkali metal,

R represents an alkyl radical having from 1 to about 8 carbon atoms or a cycloalkyl radical having from 3 to about 8 carbon atoms in the ring; and

R_1 represents fatty acid residue having from about 10 to about 18 carbon atoms.

4,539,357

PEROXIDE CURING POLYSILOXANE COMPOSITIONS HAVING A HIGH TEAR STRENGTH

William J. Bobear, Latham, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 524,102, Aug. 16, 1983, abandoned, which is a continuation of Ser. No. 389,034, Jun. 16, 1982, abandoned. This application Aug. 29, 1984, Ser. No. 645,528
Int. Cl.³ C08K 5/54
U.S. Cl. 524—267 **66 Claims**

1. A polysiloxane composition curable to a silicone elastomer comprising:

(A) 60–95 parts by weight of a vinyl-terminated linear diorganopolysiloxane gum having a viscosity in the range of 1×10^6 to 20×10^7 centipoise at 25° C. and having a vinyl concentration in the range of 0.005 to 0.1 mole percent vinyl and where the organo groups are monovalent hydrocarbon radicals;

(B) 5.0 to 40.0 parts by weight of a vinyl-containing diorganopolysiloxane gum having a viscosity in the range of 20×10^6 to 100×10^6 centipoise at 25° C. and having a vinyl concentration in the range of 0.5 to 15.0 mole percent, wherein the organo groups are monovalent hydrocarbon radicals and the sum of (A) and (B) equals 100 parts by weight;

(C) 10 to 300 parts by weight of filler, at least part of which is a reinforcing silica filler;

(D) 0.1 to 25 parts by weight of hydride-containing polysiloxane having a hydride content ranging from 0.05 to 5.0 percent by weight and having a viscosity ranging from 10 to 1000 centipoise at 25° C.; and

(E) an effective amount of an organic peroxide free radical initiator curing agent.

4,539,358

POLYCARBONATE COMPOSITIONS

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Continuation of Ser. No. 132,331, Mar. 20, 1980, abandoned. This application Jul. 20, 1983, Ser. No. 515,488
Int. Cl.³ C08L 73/00; C08K 5/09, 5/12
U.S. Cl. 524—285 **12 Claims**

1. A ternary polycarbonate composition comprising in admixture, a high molecular weight aromatic polycarbonate, a minor amount of an acrylate copolymer which is a copolymer of a C_1–C_5 acrylate and a C_1–C_5 methacrylate, and a minor amount of an organic ester plasticizer.

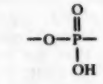
4,539,359

ONE COMPONENT CURING COMPOSITION

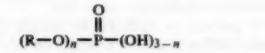
Yasushi Kato, and Hisao Furukawa, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 5, 1983, Ser. No. 520,685
Claims priority, application Japan, Aug. 18, 1982, 57-142965
Int. Cl.³ C08F 8/40
U.S. Cl. 524—376 **9 Claims**

1. A one component curing composition comprising (A) a vinyl polymer having on the main polymer chain end or a side chain thereof at least one silyl group containing a silicon atom to which a hydrolyzable group is linked, per one polymer molecule, the main chain of the vinyl polymer consisting essentially of a polymer of a vinyl monomer, and from 0.01 to 10 parts by weight of (B) an acid phosphoric compound containing a



linkage in the molecule per 100 parts by weight of the vinyl polymer (A); said acid phosphoric compound being a compound of the formula:



wherein n is 1 or 2 and R is an organic residue or a titanate coupling agent containing the

linkage in the molecule.

4,539,360

METAL FIXATIVE IN AUTOMATIVE PAINT

Richard A. Cowles, Perrysburg, Ohio, assignor to Inmont Corporation, Clifton, N.J.

Filed Apr. 28, 1983, Ser. No. 489,656
Int. Cl.³ C08K 3/08
U.S. Cl. 524—441 **2 Claims**

1. An automotive paint coating composition for use as a base coat in a base coat/clear topcoat coating composition comprising:

3–10% uniformly dispersed aluminum flake pigment;

0.05–2% suspending aid;

20–50% thermoplastic acrylic vehicle;

40–75% organic solvent;

wherein the improvement comprises including about 5% to about 25% chlorinated polyolefin to properly orient the metal-

lic pigment flakes such that the metallic pigment flakes are oriented substantially parallel to a substrate after application so as to produce a coating composition free from mottling, ghosting, general discontinuities or any visual apparition signifying disorientation of the included metal after application.

4,539,361

METHOD FOR MAKING POLYMODAL AQUEOUS SYNTHETIC RESIN DISPERSIONS

Werner Siol, Darmstadt-Eberstadt; Wolfgang Klesse, Mainz; Norbert Suetterlin, Ober-Ramstadt, and Hubert Rauch, Weiterstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 613,171, May 23, 1984, abandoned. This application Mar. 4, 1985, Ser. No. 708,096

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319340

Int. Cl.³ C08J *3/06*

U.S. Cl. 524—458 **2 Claims**

1. A method for making an aqueous synthetic resin dispersion comprising at least two particle families of different average particle size, the largest particle family having an average particle diameter of 0.6 micron or less and the average particle size of the next smaller particle family being at most two-thirds of the average particle size of the largest particle family, which method comprises

(a) gradually adding an ethylenically unsaturated monomer difficultly soluble in water or a mixture of ethylenically unsaturated monomers forming a polymer which is insoluble under the conditions of polymerization, as such or in the form of an aqueous emulsion, to an aqueous phase containing an emulsifier and a water soluble polymerization initiator and having a temperature at which polymerization of said monomers is effected, whereby synthetic resin particles are formed;

(b) adding a seed latex containing synthetic resin particles to the polymerization mixture in the course of the polymerization after 2 weight percent, but before more than 40 weight percent, of said monomers have been converted, the particles of said seed latex being smaller by a factor ranging from 2 to 15 than are the particles already formed by the emulsion polymerization of step (a) (the size of the particles being calculated as average particle diameters), the amount by weight of the particles in the seed latex being not greater than 10 percent by weight of the monomers, the ratio by weight of particles of said seed latex to the weight of the monomers already added being from 1:4 to 1:500, and the amount of emulsifier used in step (a) being such that no free emulsifier is present in the polymerization mixture when said seed latex is added;

(c) continuing the monomer addition under emulsion polymerization conditions after the addition of said seed latex and terminating said monomer addition and emulsion polymerization before the average particle diameter of the largest particle family is larger than 0.6 micron.

4,539,362

POLYMERIZATION PROCESS

Stephen P. Davies, Melbourne, Australia, and Morice W. Thompson, Maidenhead, England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 16, 1983, Ser. No. 494,886

Claims priority, application United Kingdom, May 20, 1982, 8214675

Int. Cl.³ C08L *33/04*

U.S. Cl. 524—458 **9 Claims**

1. A process for the preparation of a sterically stabilised aqueous polymer dispersion, in which at least one ethylenically unsaturated monomer, having a solubility in water in the range 0.08%–8% by weight but giving rise to a polymer which is insoluble in water, is emulsified in water and is subjected in that state to polymerisation in the presence of (a) a non-ionisable free-radical organic azo polymerisation initiator which is water-soluble and is substantially insoluble in the monomer or monomers, having a distribution ratio between water and pure styrene of at least 12 and (b) a precursor for the formation in situ of an amphipathic block or graft copolymer steric stabiliser for the polymer particles produced, the said precursor containing in the molecule a polymer chain derived from a polyethylene glycol, or a monomethyl ether thereof, of molecular weight in the range 2000–4000, and also containing in the molecule an unsaturated grouping with which the monomers can copolymerise, the azo initiator being present in an amount of from 0.1 mol % to 3.0 mol % of the amount of monomer being polymerised and the stabiliser precursor being present in an amount such as to provide, after copolymerization with the monomers, from 0.5% to 20% by weight of stabiliser based on the monomer being polymerised.

4,539,363

PIGMENTED BASECOAT COMPOSITION

Alan J. Backhouse, South Ascot, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 464,866, Feb. 8, 1983, abandoned. This application Sep. 17, 1984, Ser. No. 651,313

Claims priority, application United Kingdom, Oct. 21, 1981, 8012199

Int. Cl.³ C08L *33/02*

U.S. Cl. 524—460 **9 Claims**

1. A basecoat composition suitable for use in a process for the production of a multi-layer protective and/or decorative coating upon a substrate surface, which process comprises the steps of:

(1) applying to the surface a basecoat composition;

(2) forming a polymer film upon the surface from the composition applied in step (1);

(3) applying to the basecoat film so obtained a transparent topcoat composition comprising (d) a film-forming polymer, and (e) a volatile carrier liquid for the said polymer;

(4) forming a second polymer film upon the basecoat film from the composition applied in step (3); and

(5) curing the polymer film from steps (2) and (4), said basecoat composition comprising:

(a) a film-forming material,

(b) a volatile liquid medium for said material, and

(c) pigment particles dispersed in said medium; characterised in that constituents (a) and (b) of the basecoat composition are provided by a pseudoplastic or thixotropic dispersion in an aqueous medium of crosslinked polymer microparticles which have a diameter in the range of about 0.01 to about 10 microns, are insoluble in the same aqueous medium and are stable towards gross flocculation, the dispersion having been produced by the steps of:

(I) polymerising in an aqueous medium in thepresence of a stabiliser a first mixture of ethylenically unsaturated monomers consisting of:

(i) 98.5–90% by weight of monomers which contain in the molecule a single polymerisable unsaturated grouping, and

(ii) 1.5–10% by weight of monomers which contain in the molecule at least two polymerisable unsaturated groupings, so as to produce a dispersion of particles of crosslinked polymer;

(II) polymerising in the same medium and in the presence of the said crosslinked particles a second mixture of ethylenically unsaturated monomers consisting of:

(iii) 2–30% by weight of an unsaturated carboxylic acid,

(iv) 0–30% by weight of a hydroxyl group-containing monomer, and

(v) 40–98 parts by weight of one or more other monomers different from those of (iii) or (iv), so as to produce a non-crosslinked polymer which is capable of forming a water-soluble salt derivative, the crosslinked polymer constituting 40–95% by weight of the total polymer of steps (I) and (II), and

(III) subsequently forming the said salt derivative by neutralis-

ing the carboxyl groups present in the non-crosslinked polymer with an inorganic or organic base in the presence of the same aqueous medium.

4,539,364

HOT MELT SIZES

Jean-Claude Pollet; Martin C. Flautt, both of Granville, and Gordon P. Armstrong, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 29, 1984, Ser. No. 614,362
Int. Cl.[3] C08L *91/08*
U.S. Cl. 524—488 **10 Claims**

1. A non-aqueous hot melt coating composition consisting of a thermoplastic rubber block copolymer, a polyethylene wax and a low molecular weight resin compatible with the end block of the rubber block copolymer, wherein said composition is a 100 percent solids formulation containing said polyethylene wax in an amount within the range of from about 30 to about 80 weight percent.

4,539,365

UNIVERSAL CEMENT FOR NATURAL AND SYNTHETIC RUBBER TIRE COMPOUNDS

Chong-Kon Rhee, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 21, 1984, Ser. No. 581,512
Int. Cl.[3] C08K *3/04*
U.S. Cl. 524—495 **7 Claims**

1. An adhesive composition for tread splicing containing
(a) from 75 to 90 parts by weight of a cis-polybutadiene elastomer having a Mooney viscosity (ML-4) of at least 30;
(b) from 10 to 25 parts by weight of natural rubber;
(c) from 40 to 80 parts by weight of reinforcing carbon black having a surface area of at least 70 m^2/g;
(d) from 5 to 30 parts by weight of a p-alkylphenol tackifying resin; and,
(e) other compounding ingredients including zinc oxide, sulfur and an accelerator; the amounts by weight being based on 100 parts by weight of rubbers contained in the composition;
said adhesive composition having an AMEDA carbon black dispersion rating of at least 95 percent.

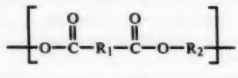
4,539,366

SIZING COMPOSITION AND METHOD OF MAKING SAME AND USE THEREOF FOR SIZING TEXTILE YARNS

Pierre Gagne, Tassin la Demi Lune; Yvette Girardeau, Fontaines sur Saone, and Bernard Pointud, Dardilly, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

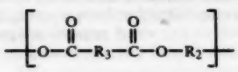
Filed Feb. 22, 1984, Ser. No. 582,483
Claims priority, application France, Feb. 23, 1983, 83 02917
Int. Cl.[3] C08L *33/08, 31/04, 75/06*
U.S. Cl. 524—507 **19 Claims**

1. A composition for sizing warps of textile yarns comprising in aqueous solution
(a) an anionic polyester-urethane of molecular weight between 10,000 and 100,000 having a plurality of polyester blocks therein derived from at least one chain formation of units of the formulas (I) and (II), said blocks being joined together by groups of the formula (III)

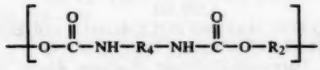


(I)

-continued

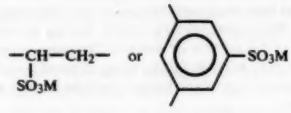


(II)

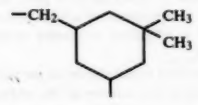


(III)

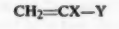
wherein:
R_1 is a divalent radical represented by a saturated hydrocarbon radical, an unsaturated aliphatic hydrocarbon radical or a monocyclic aromatic radical;
R_2 is a divalent radical represented by a saturated aliphatic radical or a saturated cyclic hydrocarbon radical;
R_3 is a divalent radical selected from



M being an alkali metal;
R_4 is a divalent radical selected from the group consisting of hexamethylene, tetramethylhexamethylene,



m-phenylene, p-phenylene, 2,4-tolylene, 2,6-tolylene, dicyclohexylmethane-4,4'-diyl, diphenylmethane-4,4'-diyl and naphthalene-1,5-diyl; and
(b) a polymer derived from
(i) an acrylic monomer of the formula:



(IV)

wherein X is a hydrogen atom or methyl radical and Y is one of the following groups:

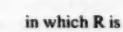
—COOH

—COOZ

(Z being an alkyl radical containing 1 to 8 carbon atoms)

or

and/or
(ii) a vinyl monomer corresponding to the formula:



(V)

in which R is a hydrocarbon radical having from 1 to 20 carbon atoms,
wherein sid composition comprises from about 40 to about 90 weight percent of said polyester-urethane and from about 10 to 60 weight percent of said polymer of (b).

4,539,367
LOW MODULUS ONE-COMPONENT RTV COMPOSITIONS AND PROCESSES

Dale M. Beers, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 512,566, Jul. 11, 1983, Pat. No. 4,513,115, which is a continuation of Ser. No. 349,537, Feb. 17, 1982, abandoned. This application Sep. 28, 1984, Ser. No. 656,108

Int. Cl.³ C08K 5/54

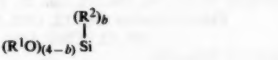
U.S. Cl. 524—731 **34 Claims**

1. A mixture comprising

(a) 100 parts of a silanol-terminated organopolysiloxane consisting essentially of chemically combined units of the formula

(b) a stabilizing amount of a silane scavenger for hydroxy functional groups of the formula

(c) 0 to 10 parts of a cross-linking silane of the formula



(d) an effective amount of a condensation catalyst, and

(e) where ingredient (b) is enoxy functional, 0.1 to 5 parts of a curing accelerator selected from the group consisting of substituted guanidines, amines and mixtures thereof, where R is selected from $C_{(1-13)}$ monovalent substituted and unsubstituted hydrocarbon radicals, R^1 is a $C_{(1-8)}$ aliphatic organic radical selected from the group consisting of alkyl, alkylether, alkylester, alkylketone and alkylcyano radicals and a $C_{(7-13)}$ aralkyl radical, R^2 is a $C_{(1-13)}$ monovalent substituted or unsubstituted hydrocarbon radical, X is a hydrolyzable leaving group selected from the group consisting of amido, amino, carbamato, enoxy, imidato, isocyanato, oximato, thioisocyanato and ureido radicals, and a is an integer equal to 1 or 2, b is a whole number equal to 0 or 1, and

the sum of a+b is equal to 1 or 2; and from 2 to 20 parts by weight per 100 parts by weight of said organopolysiloxane of a first plasticizer fluid siloxane containing a high degree of trifunctionality and mixtures of tri- and tetrafunctionality comprising

(i) from 5 to 60 mole percent of monoalkylsiloxy units, siloxy units or a mixture of such units;

(ii) from 1 to 6 mole percent of trialkylsiloxy units and

(iii) from 34 to 94 mole percent of dialkyl siloxy units, said polysiloxane containing from about 0.1 to 2% by weight of silicon-bonded hydroxyl groups.

4,539,368
TECHNOLOGY FOR THE PRODUCTION OF INVERSE EMULSION POLYMERS

John J. Duncan, Mableton, and Andrejs Zvejnieks, Atlanta, both of Ga., assignors to AZS Corporation, Atlanta, Ga.

Filed Jul. 26, 1984, Ser. No. 634,539

Int. Cl.³ C08K 5/36; C08L 33/00

U.S. Cl. 524—748 **8 Claims**

1. A process for preparing a water-in-oil emulsion of an anionic polymer, which comprises: emulsion polymerizing an anionic monomer in a water-in-oil emulsion containing a mixture of an anionic sulfosuccinate surfactant and a nonionic surfactant.

4,539,369
PROCESS FOR PRODUCING POLY (VINYL ACETALS)

Louis R. Duckwall, Jr., Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 528,343, Aug. 31, 1983, abandoned. This application Jul. 30, 1984, Ser. No. 634,051

Int. Cl.³ C08F 16/06

U.S. Cl. 525—61 **4 Claims**

1. A catalyst free method for the production of poly (vinyl acetals) comprising

contacting poly (vinyl alcohol) with a stoichiometric excess of at least one aldehyde containing from 1 to 6 carbon atoms in a liquid state at a temperature from about 60° C. to about 150° C. and pressure from about 1 to 15 atmospheres to carry out a condensation reaction to produce poly (vinyl acetal) and water, wherein the reaction proceeds by removing aldehydes and water as an aldehyde-water azeotrope until the reaction is completed.

4,539,370
THERMOPLASTIC MOULDING COMPOSITIONS

Werner Nouvertné , Krefeld, and Wolfgang Stix, Neckarsteinach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 17, 1984, Ser. No. 631,635

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327273; Oct. 13, 1983, 3337295

Int. Cl.³ C08L 69/00

U.S. Cl. 525—67 **11 Claims**

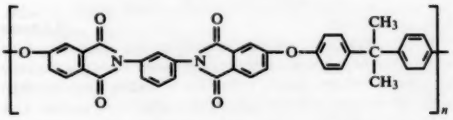
1. Thermoplastic moulding compositions containing

(A) 95 to 50 parts by weight of thermoplastic, aromatic polycarbonates obtained from at least one of hydroquinone, resorcinol, dihydroxy-diphenyls, bis-(hydroxypenyl)-C_1–C_8-alkanes, bis-(hydroxyphenyl)-C_5–C_6-cycloalkanes, bis-(hydroxyphenyl) sulphides, bis-(hydroxyphenyl) ethers, bis-(hydroxyphenyl) ketones, bis-(hydroxyphenyl) sulphoxides, bis-(hydroxyphenyl) sulphones or α,α'-bis-(hydroxyphenyl)-diisopropylbenzenes with weight-average molecular weights $\overline{M}_w$ between 10,000 and 200,000 with $\overline{M}_w$ determined by means of light scattering,

(B) 50 to 5 parts by weight of thermoplastic polyalkylene terephthalate,

(C) 3 to 15 parts by weight of an elastomeric polymer obtained by polymerizing at least two monomers selected from chloroprene, butadiene, isoprene, isobutene, styrene, acrylonitrile, ethylene, propylene, vinyl acetate and (meth)acrylate esters of alcohols having 1–8 carbon atoms, and having a glass transition temperature of less than −20° C.;

the sum of the parts by weight of (A)+(B)+(C) in each case being 100 parts by weight, characterized in that the polycarbonate component (A) contains 2 to 16% by weight based on the sum of (A)+(D), of (D) which is a thermoplastic polyether-imide of the formula



wherein "n" is the degree of polymerization, which corresponds to a number-average molecular weight ($\overline{M}_n$) of between 10,000 and 50,000 g/mol.

4,539,371

HIGH IMPACT POLY(P-METHYLSTYRENE) POLYMERS

Binnur Z. Gunesin, Warren, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1983, Ser. No. 566,984
Int. Cl.[3] C08L *53/02*
U.S. Cl. 525—98 6 Claims

1. A method of improving the environmental stress crack resistance of high impact poly(p-methylstyrene), comprising

(a) melting said high impact poly(p-methylstyrene) at a temperature between 150° and 250° C.;

(b) blending an additive copolymer with said melted high impact poly(p-methylstyrene) capable of imparting a higher environmental stress crack resistance to the final blend of said high impact poly(p-methylstyrene) and said additive copolymer, said additive copolymer being selected from the group comprising linear low density polyethylene, polypropylene, polycarbonate, ethylene methylacrylate acrylic acid terpolymer, polyethylene teraphalate glycol, polystyrene-polybutadiene diblock, and budadiene-paramethylstyrene diblock, said blending occurring at a temperature between 150° and 250° C.

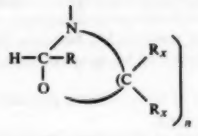
4,539,372

CATIONIC PAINT BINDERS AND PROCESS FOR PRODUCING SAME

Willibald Paar, Graz, Austria, assignor to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Dec. 20, 1983, Ser. No. 563,562
Claims priority, application Austria, Dec. 20, 1982, 4600/82
Int. Cl.[3] C08F *8/32*
U.S. Cl. 525—128 12 Claims

1. Cationic resin comprising the reaction product of (1) a polymeric material containing hydroxy groups functionally reactive with an isocyanate group, and (2) a monoisocyanate compound, said monoisocyanate compound being the reaction product of a diisocyanate and a hydroxy-free tertiary amine, said amine having the structure



wherein R and R_x are a hydrogen atom; an alkyl radical or an aryl radical and n is 2 or 3, the quantity of basic component being selected in order that the cationic resin is at least substantially free of —NCO groups and has an amine value of at least 35 mg KOH/g.

4,539,373

THERMOPLASTIC POLYELECTROLYTE COMPLEXES

Inder Mani, Midland, and Glen L. Gunderman, Clare, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 12, 1982, Ser. No. 397,625
Int. Cl.[3] C08L *33/02, 39/00, 33/04, 41/00*
U.S. Cl. 525—203 15 Claims

1. A thermoplastic polyelectrolyte complex comprising (a) a water-soluble polyanion which is a polymer having a plurality of anionic groups which polyanion is ionically crosslinked with (b) a water-soluble polycation which polycation is a polymer containing a plurality of pendant cationic moieties wherein at least one of the polyanion or polycation contains repeating soft mers, and wherein the proportion of said soft mers contained in said polyanion and polycation and the cationic moieties present in said polycation are chosen such that said polyelectrolyte complex is thermoplastic.

4,539,374

POLYOLEFIN WITH IMPROVED PROCESSING PROPERTIES

Jeff T. Fenton, Stillwater; Allan J. Lundeen, Ponca City; Mark P. Mack, Ponca City, and Jean A. Merrick, Ponca City, all of Okla., assignors to E. I. Du Pont de Nemours and Company, Ponca City, Okla.

Filed Mar. 21, 1984, Ser. No. 591,725
Int. Cl.[3] C08L *23/04, 23/20, 23/24*
U.S. Cl. 525—240 9 Claims

1. A method for improving the processing characteristics of extrudable, substantially crystalline polyolefin polymers and copolymers prepared from monomers containing from 2 to 10 carbon atoms, comprising incorporating into a said polymer or copolymer up to 1.5% by weight of a substantially non-crystalline hydrocarbon soluble homopolymer of a C_8–C_{30} monolefin monomer or copolymer thereof formed with monolefin monomers containing from 2 to 30 carbon atoms, said incorporated homopolymer or copolymer having an inherent viscosity of at least 6.0 deciliters per gram at a shear rate of 300° sec^{-1} at 25° C.

4,539,375

DUNKELSPERSERS

David L. Dunkelberger, Newtown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 256,202, Apr. 21, 1981, Pat. No. 4,440,905.
This application Oct. 12, 1983, Ser. No. 541,392
Int. Cl.[3] C08F *4/04, 4/34*
U.S. Cl. 525—260 1 Claim

1. A process for preparing an improved impact modifier composition comprising an intimate admixture of from about 99.5 to about 96 parts by weight of an elastomeric impact modifier polymer prepared by emulsion polymerization and from about 0.5 to about 4 parts by weight of a dunkelsperser polymer or copolymer formed from at least 50 weight percent of at least one monomer selected from the group consisting of styrene, substituted styrene, an olefin, and an unsaturated ester of an organic acid different from the methyl ester of methacrylic acid, said improved impact modifier composition being formed by a free radical initiated polymerization of said monomer or monomers in the presence of an adjusted emulsion containing said elastomeric impact modifier polymer by

adding an emulsifier to reduce the surface tension of the emulsion containing said elastomeric impact modifier polymer to or below its critical micelle concentration;

heating the adjusted emulsion to a temperature sufficient to initiate the subsequent free radical initiated polymerization of said monomer or monomers;

adding to said heated, adjusted emulsion a second emulsion containing said monomer or monomers and at least one free radical initiator;

allowing polymerization of said monomer or monomers to form a dunkelsperser polymer in intimate admixture with said elastomeric impact modifier polymer; and

isolating the improved impact modifier composition from said emulsion.

4,539,376

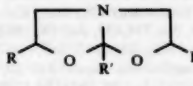
CROSS-LINKING OF MALEIC ANHYDRIDE POLYMERS WITH BICYCLIC AMIDE ACETALS

Anil B. Goel, Worthington, and Harvey J. Richards, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ky.

Filed Oct. 9, 1984, Ser. No. 659,200
Int. Cl.[3] C08F *8/30*
U.S. Cl. 525—375 8 Claims

1. The process for cross-linking a maleic anhydide homopolymer or interpolymer with at least one other mono vinyl mon-

omer comprising reacting said homopolymer or interpolymer with a bicyclic amide acetal conforming to the formula



wherein R represents hydrogen or an alkyl group having from 1 to 18 carbon atoms, R′ represents an alkyl group having from 1 to 18 carbon atoms or an aryl or alkaryl group having from 6 to 18 carbon atoms, and R″ represents hydrogen or an alkyl group having from 1 to 18 carbon atoms, an aryl group having from 6 to 12 carbon atoms, or a hydrogen ether group having from 2 to 18 carbon atoms.

4,539,377

ALKENYLPHENYLGLYCIDYL ETHER CAPPED HYDROXYSTYRYL PYRIDINES (PYRAZINES) AND POLYMERS THEREOF

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

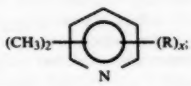
Filed Jul. 19, 1984, Ser. No. 632,346
Int. Cl.³ C08F *283/06*
U.S. Cl. 525—401 **10 Claims**

1. A thermosettable product which comprises the reaction product of

(A) at least one of

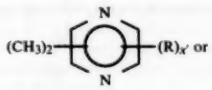
(1) one or more pyridine compounds represented by the formula

I.



(2) one or more pyrazine compounds represented by the formula

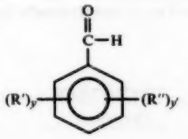
II.



(3) a mixture of 1 and 2; with

(B) a substituted aromatic aldehyde represented by the formula

III.

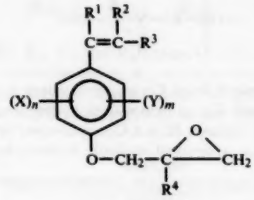


wherein each R is independently hydrogen, hydroxyl, methyl or ethyl; each R′ is independently a hydroxyl or a

group; each R″ is independently hydrogen, methyl or ethyl; x has a value of 3; x′ has a value of 2; y has a value of 1 or 2; y′ has a value of 3 or 4; the sum of y and y′ has a value of 5; and with the proviso that at least one of R or R′ is a hydroxyl group to provide a hydroxyl functional precursor which is then reacted with

(C) an alkenylphenylglycidyl ether having the formula

IV.



wherein each R^1, R^2, R^3 and R^4 is independently hydrogen or a hydrocarbyl group having from 1 to 3 carbon atoms; each X is independently hydrogen, a hydrocarbyl group having from 1 to 4 carbon atoms, chlorine, bromine, a phenyl group or a methoxy group; each Y is independently hydrogen or a hydrocarbyl group having from 1 to 4 carbon atoms and n and m are positive integers, and the sum of n plus m has a value of 4 whereby at least about one percent of the rings of the reaction product of (A) and (B) is etherified with said alkenylphenylglycidyl ether.

4,539,378

VINYL POLYMER POLYOLS MADE USING EPOXY RESIN-MODIFIED POLYOLS

Michael Cuscurida, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 27, 1984, Ser. No. 654,903
Int. Cl.³ C08G *65/32, 18/14, 18/67;* **C08L** *71/02*
U.S. Cl. 525—407 **14 Claims**

1. A vinyl polymer polyol prepared by the process comprising

polymerizing via a free-radical reaction a monomer component consisting of at least one vinyl monomer in the presence of an epoxy resin-modified polyol.

13. A vinyl polymer polyol prepared by the process comprising

polymerizing via a free-radical reaction

a. a vinyl monomer component consisting of styrene and acrylonitrile in a molar ratio ranging from 9:1 to 1:9 in the presence of a free-radical initiator, also in the presence of

b. an epoxy resin-modified polyol made by reacting a polyol initiator having an active hydrogen functionality of 3 to 8 and one or more alkylene oxides with an epoxy resin such that the epoxy resin is added internally along the length of the resultant epoxy resin-modified polyol which has a 2,000 to 7,000 molecular weight,

at a temperature in the range of 75° to 150° C. and a pressure in the range of atmospheric to about 100 psig, to give a vinyl polymer polyol with a polymer loading in the range of 5 to 50 wt. %.

4,539,379

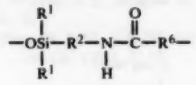
METHOD FOR MAKING SILICONE-POLYESTER COPOLYMERS

John E. Hallgren, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 25, 1984, Ser. No. 613,945
Int. Cl.³ C08F *283/02*
U.S. Cl. 525—446 **6 Claims**

1. A method which comprises, agitating under reduced pressure at a temperature of 200° C. to 350° C. in the substantial absence of an organic solvent, a mixture of aminoalkyl chain-stopped polydiorganosiloxane and a molten thermoplastic polyester to produce a silicone-polyester copolymer having a

silicone block and a polyester block joined together by a siloxy organoamide linkage having the formula



where R^1 is selected from $C_{(1-13)}$ monovalent hydrocarbon radicals, substituted $C_{(1-13)}$ monovalent hydrocarbon radicals and $C_{(1-8)}$ alkoxy radicals, R^2 is a $C_{(2-13)}$ divalent organo radical and R^6 is a $C_{(6-13)}$ divalent aromatic hydrocarbon radical.

4,539,380

PROCESS FOR PRODUCING HOMOPOLYMERS OR COPOLYMERS OF OLEFINICALLY UNSATURATED MONOMERS

Cheng-Yi Cheng; Shou-Yuan Lee; Kwang-Ming Chen, and Won-Doon Hong, all of Kao Hsiung, Taiwan, assignors to Formosa Plastics Corporation, Taipei, Taiwan

Filed Jul. 14, 1983, Ser. No. 513,905

Int. Cl.³ C08F 2/00

U.S. Cl. 526—78 **16 Claims**

1. A process for producing polymers of oil-soluble olefinic monomer(s) and copolymers thereof, characterized by comprising the steps of in an aqueous media conducting an emulsion polyermization of soil-soluble olefinic monomer in the absence of emulsifiers and in the presence of a water-soluble initiator and at a polymerization reaction temperature of about 30° C. to about 75° C., introducing an electrolytic solution of water-soluble inorganic salts and a buffer solution into the polymerization mixture only when the conversion of the reaction reaches about 5% to about 30% to adjust the pH value of the reaction mixture to the range of about 7.5 to about 11.5, and applying a two-stage alteration of the speed of agitation, the speed of agitation being altered from a first higher speed range during initiation of the polymerization to a second lower speed range after initiation and during polymerization to maintain stability of the colloidal state of the polymerization mixture, whereby polymer resins having no emulsifier residue contained within the polymer particles and having improved properties are produced.

4,539,381

CHELATE-ACTIVATED VINYL CHLORIDE POLYMERIZATION PROCESS

Ross J. Cozens, Welwyn Garden City, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Apr. 25, 1983, Ser. No. 488,608

Claims priority, application United Kingdom, May 6, 1982, 8213055

Int. Cl.³ C08F 2/18

U.S. Cl. 526—93 **10 Claims**

1. A process for the polymerisation of vinyl chloride in aqueous suspension or microsuspension using an organo-soluble free-radical-yielding initiator wherein the initiator is progressively activated during the polymerisation said activation being effected by the progressive reduction during the polymerisation of a non-initiator-activating water-soluble metal chelate complex which is present to an initiator-activating form of the metal chelate complex in which the metal is in a lower oxidation state and selected from the group consisting of iron, copper, cobalt, chromium, manganese, nickel, zinc and tin and ratio of non-initiator-activating metal chelate complex-/initiator is within the range of from 1/10000 to 1/1.

4,539,382

ADHESIVE COMPOSITION

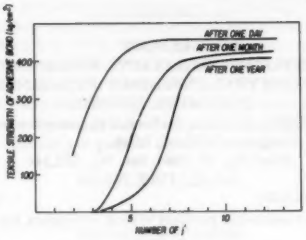
Ikuo Omura; Junichi Yamauchi, both of Kurashiki; Yoshinori Nagase, Takatsuki, and Fumiko Uemura, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation of Ser. No. 398,437, Jul. 14, 1982, abandoned. This application Aug. 22, 1983, Ser. No. 525,410

Claims priority, application Japan, Jul. 29, 1981, 56-119536; Jul. 29, 1981, 56-119537; Jul. 30, 1981, 56-120371; Jan. 28, 1982, 57-13038; May 4, 1982, 57-74830; Jan. 14, 1983, 58-4476

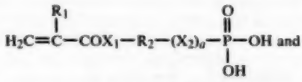
Int. Cl.³ A61K 6/02; C08F 4/34; C09K 3/00

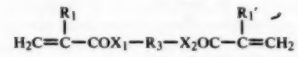
U.S. Cl. 526—276 **86 Claims**



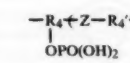
1. A method of restoring a carious tooth, comprising:

applying to the wall surface of a cavity in a carious tooth an adhesive composition which comprises 100 parts by weight of a polymerizable monomer comprising (a) 1.5 to 50 parts by weight of a compound represented by one of formulas I and II:





where R_1 and R_1' each stand for hydrogen or a methyl group, R_2 stands for a divalent organic residue having 4 to 40 carbon atoms, X_1 and X_2 each stand for —O—, —S— or —NH—, a is 0 or 1, and R_3 stands for a group of the formula



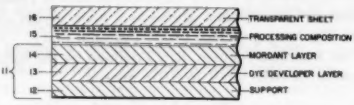
having 6 to 40 carbon atoms, where R_4 and R_4' each stand for a hydrocarbon group having 1 to 29 carbon atoms, which is unsubstituted or substituted by a halogen atom, or a hydroxyl, amino or carboxyl group, and b is an integer of 0 to 3, a plurality of R_4' being the same or different, at least one of R_4 and R_4' having at least three carbon atoms, and Z stands for —O—, —COO— or —NH—, and (b) 50 to 98.5 parts by weight of a vinyl monomer copolymerizable with said compound, and 0.01 to 20 parts by weight of a curing agent; and

filling said cavity with a dental filling composition comprising a polymerizable monomer, a filler and a curing agent.

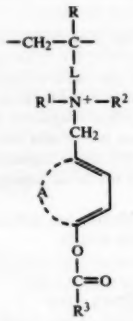
4,539,383
TEMPORARY POLYMERIC MORDANTS CONTAINING ACETOXYBENZYL SUBSTITUTED QUATERNARY AMMONIUM GROUPS

Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

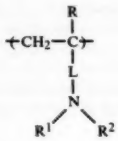
Division of Ser. No. 289,289, Aug. 3, 1981, Pat. No. 4,424,272.
This application Dec. 20, 1983, Ser. No. 563,351
Int. Cl.³ C08F *220/58, 220/70, 20/70*
U.S. Cl. 526—304 **15 Claims**



1. A polymer comprising recurring units of the formula



wherein R is hydrogen or lower alkyl; each of R^1 and R^2 is independently lower alkyl, cycloalkyl, substituted lower alkyl, aralkyl, or R^1 and R^2 taken together represent the atoms necessary to complete a saturated N-containing ring; L is a divalent linking group; A represents the atoms necessary to complete an arylene nucleus; R^3 is lower alkyl, aryl, aralkyl, alkoxy, or aryloxy; and X^- is an anion; said polymer being capable of conversion in an alkaline environment to a polymer comprising recurring units of the formula



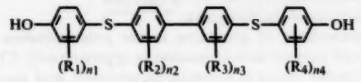
wherein R, L, R^1 and R^2 are as previously defined.

4,539,384
POLYMERS PREPARED FROM 4,4'-BIS(4-HYDROXYPHENYL THIO)BIPHENYLS

Sivaram Krishnan, Moers, Fed. Rep. of Germany, and John R. Sanderson, Austin, Tex., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 383,893, Jun. 1, 1982, Pat. No. 4,463,163.
This application May 7, 1984, Ser. No. 607,554
Int. Cl.³ C08G *18/28, 63/66, 63/68, 65/40*
U.S. Cl. 528—79 **1 Claim**

1. A copolymer resin comprising structural units derived from



wherein R_1, R_2, R_3 and R_4 independently are C_1–C_4 alkyl, chlorine or bromine and n_1, n_2, n_3 and n_4 independently are 0, 1 or 2, said polymer selected from the group consisting of polyurethane, polyester, polysulfone and polyether.

4,539,385
SELF-CROSSLINKING, HEAT-CURABLE GRINDING RESIN

Michael Geist, Münster, and Günther Ott, Münster-Wolbeck, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,767
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322781
Int. Cl.³ C08G *59/14, 59/16*
U.S. Cl. 528—100 **12 Claims**

1. A self-crosslinking, heat-curable binder, in particular for electrocoating finishes, based on an organic synthetic resin which contains primary and/or secondary hydroxyl groups and esterified carboxyl groups and may contain amino groups, wherein the synthetic resin contains 0.8 to 2.0 quaternary ammonium groups per molecule, and the esterified carboxyl groups are activated in the alcohol component by a substituent which has a negative inductive effect.

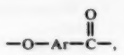
4,539,386
PROCESS FOR FORMING THERMALLY STABLE THERMOTROPIC LIQUID CRYSTALLINE POLYESTERS OF PREDETERMINED CHAIN LENGTH

Hyun-Nam Yoon, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 27, 1983, Ser. No. 517,865
Int. Cl.³ C08G *63/06, 63/60, 69/44*
U.S. Cl. 528—183 **30 Claims**

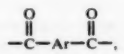
1. In a process for the formation within a polymerization zone of a polyester which is capable of forming an anisotropic melt phase and which optionally may include amide linkages through a polymerization reaction of ester-forming and optionally also amide-forming monomers to form a polymer having recurring moieties selected from the group consisting of the following where in each instance Ar comprises at least one aromatic ring:

(a)



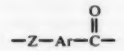
(b) —O—Ar—O—,

(c)



(d) —Y—Ar—Z—, where Y is O, NH, or NR, and Z is NH or NR where R is an alkyl group of 1 to 6 carbon atoms or an aryl group,

(e)



where Z is NH or NR where R is an alkyl group of 1 to 6 carbon atoms or an aryl group, and

(f) mixtures of the foregoing;

the improvement of providing in the polymerization zone during said polymerization reaction an approximately 0.25 to 4 percent molar excess of aromatic dicarboxylic acid monomer and/or an esterified derivative thereof which during the polymerization reaction imparts dicarboxyaryl units to the interior of the polymer chains of the resulting polymer and causes the polymer chains to terminate in carboxylic acid end groups and/or an esterified derivative thereof wherein the polymer chains achieve a predetermined average chain length through the depletion of other monomers present in the polymerization zone to yield a polyester product which is substantially incapable of additional chain growth upon subsequent heating.

4,539,387

PROCESS FOR POLYMERIZING FORMALDEHYDE

Leslie M. Blair, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

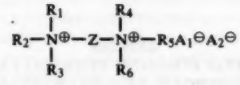
Filed Aug. 3, 1984, Ser. No. 637,578

Int. Cl.³ C08G 2/08

U.S. Cl. 528—232 **6 Claims**

1. In a process for the polymerization of formaldehyde in a hydrocarbon solvent, in the presence of a molecular weight control agent,

the improvement of using as the polymerization initiator a diquaternary ammonium compound of the following formula



wherein Z is an aliphatic or olefinic difunctional hydrocarbon radical of 2 to 10 carbon atoms, and each of R_1 through R_6 is an alkyl radical of 1 to 20 carbon atoms, at least one of R_1 through R_6 having at least 14 carbon atoms, the total number of carbon atoms in all the R_1 through R_6 radicals being at most 44; and each of $A_1^{\ominus}$ and $A_2^{\ominus}$ independently is an anion selected from the class consisting of C_1–C_{18} carboxylates, $OH^{\ominus}$, and $OR_7^{\ominus}$, where R_7 is a C_1–C_8 alkyl.

4,539,388

ACID-MODIFIED, AROMATIC HYDROCARBON RESINS AND METHOD FOR THEIR PRODUCTION

Wolfgang Lüecke, Oberhausen; Herbert Beneke, Castrop-Rauxel, and Bodo Friedrich, Duisburg, all of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 27, 1984, Ser. No. 625,276

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324817

Int. Cl.³ C08F 240/00, 12/00; C08G 61/02

U.S. Cl. 528—271 **15 Claims**

1. An acid modified, aromatic hydrocarbon resin which is the reaction product of an aromatic, unsaturated hydrocarbon with a melted aromatic carboxylic acid in the presence of a Friedel-Crafts catalyst.

8. A method for producing aromatic hydrocarbons modified with aromatic carboxylic acids, comprising polymerizing an aromatic, unsaturated hydrocarbon with a melted aromatic carboxylic acid in the presence of Friedel-Crafts catalyst and at an elevated temperature, following the polymerizing step, washing the reaction mixture with hot water and treating the washed product with an aqueous alkali solution, whereupon the aqueous phase is isolated and obtaining the desired resin product by acidification.

4,539,389

BIAXIALLY ORIENTED POLYESTER FILM

Tsutomu Kiriyama; Shigeru Horie; Tetsuo Ichihashi, and Masahiro Oshida, all of Matsuyama, Japan, assignors to Teijin Limited, Minamihonmachi, Japan

Filed Mar. 26, 1984, Ser. No. 593,237

Claims priority, application Japan, Mar. 30, 1983, 58-52517; Mar. 30, 1983, 58-52518

Int. Cl.³ C08G 63/02

U.S. Cl. 528—272 **18 Claims**

1. A biaxially oriented film of a film-forming aromatic polyester derived from an aromatic dicarboxylic acid as a main acid component and an aliphatic glycol as a main glycol component, said film having surface properties such that

(1) it has a surface flatness, R_{CLA} defined by the following equation, of from 0.001 to 0.016 micron,

$$R_{CLA} = \frac{1}{L} \int_0^L |f(x)|\,dx$$

wherein R_{CLA} is the flatness of the film surface determined by the center line average method, f(x) is the sum of vertical distances from a straight line with a length L drawn across a film surface roughness curve measured by using a needle-contacting type surface roughness tester and being nearly parallel to the base line of said curve to maximum and minimum points of said curve respectively, and L is the length stated above for use in calculating f(x) in the surface roughness curve,

(2) it has a coefficient of travelling friction, μk, defined by the following equation, of from 0.01 to 0.20,

$$\mu k = \frac{2.303}{0.844\pi} \log \frac{T_2}{T_1}$$

wherein T_2 is the tension of the film which has been caused to travel on a fixed rod of SUS 304 stainless steel having an outside diameter of 5 mm, and T_1 is its tension before passage over the fixed rod, and

(3) the following relation is established between R_{CLA} and μk,

$$0.10 \leqq 10 \times R_{CLA} + \mu k \leqq 0.31.$$

4,539,390

HIGH MOLECULAR WEIGHT UNSATURATED POLYESTERS OF CYCLOHEXANEDIMETHANOLS

Winston J. Jackson, Jr.; Herbert F. Kuhfuss, and Joseph J. Watkins, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,509

Int. Cl.³ C08G 65/52

U.S. Cl. 528—303 **9 Claims**

1. A linear unsaturated polyester comprising 100 mole % of an acid component and 100 mole % of a glycol component, said acid component comprising at least 50 mole % of repeat units from maleic or fumaric acid, and said glycol component consisting essentially of repeat units from 1,3-cyclohexanedimethanol, 1,4-cyclohexanedimethanol or mixtures thereof, said polyester having an I.V. of at least 0.5.

4,539,391

CONTINUOUS HYDROLYTIC PREPARATION OF POLYLACTAMS

Gunter Pipper, Bad Durkheim; Rainer Theysohn, Frankenthal, and Franz Zahradnik, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 21, 1984, Ser. No. 581,711

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306906

Int. Cl.[3] C08G 69/16

U.S. Cl. 528—323 7 Claims

1. A process for the continuous preparation of a molten or solid polylactam, which comprises

(a) feeding a lactam melt containing from 1 to 25% by weight of water into a prepolymerization zone,

(b) heating this lactam melt in the prepolymerization zone at from 220° to 280° C. under a pressure of from 1 to 10 bar for from 1 to 10 minutes, formation of a prepolymer melt and vaporization of the water taking place at the same time, and removing the melt from the prepolymerization zone, with the proviso that, when the melt emerges from the prepolymerization zone, the degree of conversion is not less than 85%,

(c) continuously separating off steam from the resulting melt of the prepolymer,

(d) transferring the prepolymer melt to a polymerization zone and

(e) polymerizing the prepolymer melt in the polymerization zone under superatmospheric pressure and at from 240° to 290° C.

4,539,392

METHOD OF PREPARING POLYIMIDE PREPOLYMER FROM ETHYLENICALLY UNSATURATED DICARBOXYLIC ACID COMPOUND

Sho Kadoi, and Toshihiko Aya, both of Aichi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 3, 1984, Ser. No. 627,511

Int. Cl.[3] C08G 73/12

U.S. Cl. 528—336 15 Claims

1. A method for preparing a polyimide prepolymer, which comprises effecting reaction between a polyamine which has the following general formula (I),

$$R(NH_2)_n \quad (I)$$

in which R is an organic group having not less than 2 carbon atoms ad n is an integer of 2 or above, and a compound selected from the group consisting of dicarboxylic acids having at least one aliphatic double bond and derivatives thereof in the ratio of 0.52–0.95 mole of the latter per mole of amino group contained in the polyamine used, in contact with an effective ring closing amount of an oxide of phosphorus.

4,539,393

DIMENSIONALLY STABLE POLY-M-PHENYLENE ISOPHTHALAMIDE FILM

Yorikazu Tamura; Jiro Sadanobu, both of Iwakuni, and Tsutomu Nakamura, Yamaguchi, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 5, 1983, Ser. No. 482,241

Claims priority, application Japan, Apr. 13, 1982, 57-60293; May 28, 1982, 57-89848; Jun. 7, 1982, 57-96265; Dec. 14, 1982, 57-217691

Int. Cl.[3] C08G 69/32

U.S. Cl. 528—348 5 Claims

1. An m-phenyleneisophthalamide polymer film having a density d of from 1.35 to 1.41 g/cm^3 and principal refractive indices n_α, n_β and n_γ ($n_\alpha > n_\beta > n_\gamma$) for D-line of a wavelength of 589 nm satisfying the following formula:

$$\frac{n_\alpha + n_\beta}{2} - n_\gamma \geqq 0.05.$$

4,539,394

LACTONE-MODIFIED DIOL

Yutaka Fukuda, and Kenichi Sasaki, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Jul. 11, 1984, Ser. No. 630,501

Claims priority, application Japan, Jul. 25, 1983, 58-135381

Int. Cl.[3] C08G 63/08, 65/18, 65/20

U.S. Cl. 528—354 8 Claims

1. A saturated aliphatic lactone-modified diol of the formula (II)

$$HO—Y.CO.O_p(A—O)_l(B—O)_m(CO.Y.O)_qH \quad (II)$$

wherein Y is a bivalent residue derived by removing the ester bond from a 6- to 8-carbon saturated aliphatic lactone ring, p and q are positive numbers depending on the mole number of a saturated aliphatic lactone reacted, $p+q \geqq 1$, A is

$$—CH_2—\underset{\displaystyle CH_3}{\underset{|}{CH}}—CH_2—,$$

B is $—CH_2—CH_2—CH_2—CH_2—$, and l and m are each positive numbers satisfying the relationships: l+m =about 6 to 140 and l/m=10/90 to 100/0 (molar ratio).

4,539,395

FILM-FORMING COMPOSITION COMPRISING CHLORINATED POLYALKYLENE GLYCOL

Kazuo Shimizu; Yoshiji Masaoka, both of Iwakuni, and Mutsuro Takaoka, Yamaguchi, all of Japan, assignors to Sanyo Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1984, Ser. No. 573,994

Claims priority, application Japan, Apr. 21, 1983, 58-70719

Int. Cl.[3] C08G 65/48

U.S. Cl. 528—425 7 Claims

1. A film-forming composition comprising a chlorinated polyalkyleneglycol binder produced by chlorinating a polyalkyleneglycol having a molecular weight of not less than 200 and selected from the group consisting of polyethyleneglycol, polypropyleneglycol and mixtures thereof in a solution of the polyalkyleneglycol in a chlorine-resistant solvent, to a chemically combined chlorine content of 50 to 75% by weight, based upon the weight of the produced chlorinated polyalkyleneglycol, wherein said polyalkyleneglycol binder is soluble in alcohols, aliphatic solvents and aromatic solvents.

4,539,396

PROCESS FOR PRODUCING A COAGULATED LATEX OF SPHERICAL CONFIGURATION

Hideo Yasui, Kobe, and Yasuhiro Miki, Himeji, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 12, 1982, Ser. No. 441,216

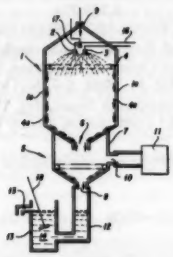
Claims priority, application Japan, Nov. 19, 1981, 56-186644

Int. Cl.[3] C08F 6/22, 6/12

U.S. Cl. 528—481 1 Claim

1. In a process for producing a coagulated latex by spraying into a coagulating chamber from an upper portion thereof a suspension liquid obtained by suspension polymerization or a high polymer latex obtained by emulsion polymerization to disperse in a desired droplet diameter, spraying simultaneously into the coagulating chamber a coagulant of the suspension liquid or the high polymer latex to disperse in the form of gas or mist, and coagulating the suspension liquid or the high

polymer latex by bringing droplets of the suspension liquid or the high polymer latex into contact with the coagulant, the improvement which comprises introducing into the coagulating chamber super-heated steam having a temperature in the range of from 110° C. to 400° C. to heat the dispersed droplets



of the suspension liquid or the high polymer latex and the dispersed coagulant and to partially dry the surfaces of the dispersed droplets, collecting coagulated particles in a film-like flow of water or an organic solvent which flows downward on or along side walls and the bottom of the coagulating chamber, and recovering the coagulated particles of a spherical shape.

4,539,397

(ALKOXYDIAZO)HALOBENZENEACETONITRILES

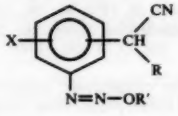
Venkataraman Ramachandran, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 488,068, Apr. 25, 1983,. This application Jul. 27, 1984, Ser. No. 635,215

Int. Cl.³ C07C *113/00, 120/00, 121/66, 121/68*

U.S. Cl. 534—556 **2 Claims**

1. A diazo compound corresponding to the formula:



wherein R is hydrogen or an alkyl group, R' is an alkyl group, and X is halo.

4,539,398

AFFINITY FRACTIONATION OF HEPARIN ON IMMOBILIZED CONCANAVALIN A

Robert D. Rosenberg, Brookline, Mass., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Continuation of Ser. No. 341,748, Jan. 22, 1982, abandoned. This application Jan. 9, 1984, Ser. No. 569,551

Int. Cl.³ C08B *37/10*

U.S. Cl. 536—21 **23 Claims**

1. A method for affinity fractionation of heparin and isolation of a highly active anticoagulant fraction, said process comprising:

(a) providing Concanavalin A immobilized on a solid substrate;

(b) providing a heparin preparation of animal tissue origin;

(c) incubating said heparin preparation with a quantity of antithrombin extracted from mammalian plasma to complex a portion of the heparin with the antithrombin;

(d) contacting the incubation product of step c with said immobilized Concanavalin A to bind said complex to the immobilized concanavalin A solid phase and to separate a depleted heparin pool as the liquid phase; and

(e) selectively eluting the heparin from the solid phase and recovering the eluted heparin as said highly active anticoagulant fraction.

4,539,399

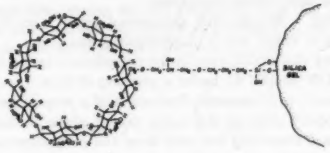
BONDED PHASE MATERIAL FOR CHROMATOGRAPHIC SEPARATIONS

Daniel W. Armstrong, Lubbock, Tex., assignor to Advanced Separation Technologies Inc., Whippany, N.J.

Filed Jul. 27, 1984, Ser. No. 635,133

Int. Cl.³ B01D *15/08;* **C08L** *5/16*

U.S. Cl. 536—103 **14 Claims**



1. The process of producing an improved chromatographic separation material which comprises:

(a) providing a silica gel in particle form;

(b) reacting said silica gel with a silane having between two and twenty carbon atoms in the chain length thereof to produce a product with an active terminal group;

(c) further reacting the active terminal group of said product with an active primary or secondary hydroxyl group or groups of a cyclodextrin, whereby said cyclodextrin is chemically bonded to said silica gel by said silane.

4,539,400

PYRIDIN-3-YL SUBSTITUTED ORTHO-FUSED PYRROLE DERIVATIVES

Jean-Louis Fabre, Paris; Daniel Farge, Thiais; Claude James, and Daniel Lavé , both of Paris, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

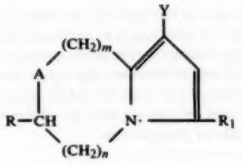
Filed Jan. 11, 1984, Ser. No. 569,909

Claims priority, application France, Jan. 13, 1983, 83 00453; Jan. 13, 1983, 83 00454

Int. Cl.³ C07D *471/04, 487/04, 498/04, 513/04*

U.S. Cl. 544—47 **14 Claims**

1. A pyrrole derivative of the formula:



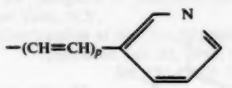
(I)

in which (a) Y represents a carboxyl radical or a radical of the formula:

(II)

in which R_2 represents an alkyl or benzyl radical, A represents a sulphur atom, m represents 1, n represents zero, R represent pyridin-3-yl and R_1 represents hydrogen; or (b) Y represents cyano, carboxyl, or a radical of the formula (II) as defined above, A represents sulphur, oxygen, or methylene, m represents 1 or 2 and n represents 0, 1 or 2, the sum of m+n being 1, 2 or 3, R represents hydrogen, alkyl, or phenyl, unsubsti-

tuted or substituted by halogen, alkyl, alkoxy or trifluoromethyl, and R_1 represents a radical of the formula:



(III)

in which p represents zero or 1, the said alkyl radicals or alkyl radicals or alkyl portions being straight-chain or branched-chain and containing 1 to 4 carbon atoms each and its addition salts with acids and, where they exist, its metal salts and its addition salts with nitrogen bases.

4,539,401

PYRIDOBENZOXAZINE DERIVATIVES USEFUL AS ANTIBACTERIAL AGENTS

Isao Hayakawa, and Yoshiaki Tanaka, both of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

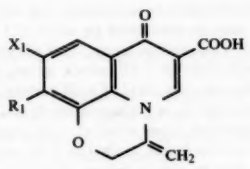
Filed Jun. 27, 1983, Ser. No. 507,652

Claims priority, application Japan, Jun. 29, 1982, 57-112040

Int. Cl.³ C07D *498/16*

U.S. Cl. 544—101 **5 Claims**

1. A benzoquinolizine derivative of formula (I)



(I)

wherein:

X_1 represents a hydrogen atom or a halogen atom, R_1 represents 1-pyrrolidinyl or 1-piperazinyl which may be substituted with one substituted selected from the group consisting of a hydroxyl group, an amino group and an alkyl group having from 1 to 6 carbon atoms, and physiologically acceptable salts thereof.

4,539,402

QUINAZOLINONE DERIVATIVES

Wolfgang Opitz, Overath; Haireddin Jacobi, Leichlingen, and Bernhard Pelster, St. Augustin, all of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co., Cologne, Fed. Rep. of Germany

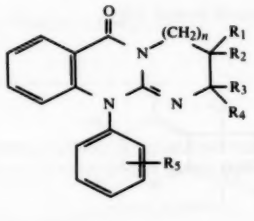
Filed May 9, 1983, Ser. No. 492,775

Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220438

Int. Cl.³ C07D *287/04*

U.S. Cl. 544—247 **5 Claims**

1. A quinazolinone derivative of the formula



I

wherein

R_1, R_2, R_3 and R_4 each represent hydrogen and n represents 0 or 1, or

R_1 and R_3 represent hydrogen,

R_2 and R_4 together represent a bond and n represents 0, or

R_1 and R_3 together represent a bond,

R_2 and R_4 together represent the grouping

and n represents 0, and

R_5 represents a trifluoromethyl, methylthio, methylsulphonyl, nitro or amino group.

4,539,403

PROCESS FOR THE PREPARATION OF A 2-ALKYL-4-AMINO-5-AMINOMETHYLPYRIMIDINE

Kozo Fujii; Keigo Nishihira; Hiroyuki Sawada; Shuji Tanaka; Mamoru Nakai; Hiroshi Yoshida; Teruhiko Inoue, and Kiyosi Oomori, all of Ube, Japan, assignors to UBE Industries, Ltd., Tokyo, Japan

Filed Jan. 26, 1983, Ser. No. 461,163

Claims priority, application Japan, Feb. 16, 1982, 57-22122; Sep. 7, 1982, 57-154661; Sep. 14, 1982, 57-158916

Int. Cl.³ C07D *239/02*

U.S. Cl. 544—326 **26 Claims**

1. A process for the preparation of a 2-alkyl-4-amino-5-aminomethylpyrimidine which comprises reacting a 2-alkyl-4-amino-5-formylpyrimidine or a salt of a mineral acid thereof with hydrogen and ammonia in an amount of at least 4 moles of ammonia per one mole of the 2-alkyl-4-amino-5-formylpyrimidine or salts thereof (a) in the presence of a reduction catalyst selected from the group consisting of palladium supported on activated carbon, nickel-diatomaceous earth, platinum supported on alumina, copperchromium powder and Raney nickel and (b) in the presence of at least one salt of divalent nickel or hydrate thereof.

25. A process for the preparation of a 2-alkyl-4-amino-5-aminomethylpyrimidine which comprises reacting a 2-alkyl-4-amino-5-formylpyrimidine or salt thereof with ammonia in a first inert solvent to form a reaction product; reacting said reaction product, without isolating the same from the reaction mixture, with a second inert solvent containing ammonia, hydrogen and the reduction catalyst to reduce said reaction product and thereby obtain 2-alkyl-4-amino-5-aminomethylpyrimidine, said ammonia being in an amount of at least 4 moles of ammonia per one mole of the 2 alkyl-4-amino-5-formylpyrimidine or salts thereof, and said reduction catalyst being selected from the group consisting of palladium supported on activated carbon, nickel-diatomaceous earth, platinum supported on alumina, copper-chromium powder and Raney nickel.

26. A process for the preparation of a 2-alkyl-4-amino-5-aminomethylpyrimidine which comprises simultaneously reacting (i) a 2-alkyl-4-amino-5-formylpyrimidine or a salt of a mineral acid thereof with (ii) hydrogen and (iii) ammonia in an amount of at least 4 moles of ammonia per one mole of the 2-alkyl-4-amino-5-formylpyrimidine or salts thereof in the presence of a reduction catalyst selected from the group consisting of palladium supported on alumina, copper-chromium powder and Raney nickel.

4,539,404

PYRIMIDINES CONTAINING SULFUR AND AMINO GROUPS AS CORROSION INHIBITORS

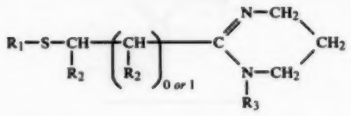
Neil E. S. Thompson, Creve Coeur; Derek Redmore, Webster Groves; Bernardus A. Oude Alink, St. Louis, and Benjamin T. Outlaw, Webster Groves, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 320,050, Nov. 10, 1981, which is a division of Ser. No. 161,198, Jun. 19, 1980, Pat. No. 4,332,967. This application Nov. 24, 1982, Ser. No. 444,418

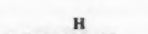
Int. Cl.³ C07D *239/02*

U.S. Cl. 544—335 **4 Claims**

1. A composition of the following formula



where R_1 is an alkyl group, R_2 is H or alkyl, R_3 is H, alkyl, $-CH_2)_2CN$,



or alkanol and n is one to ten.

4,539,405

SYNTHESIS OF 1,4-DINITROFURAZANO(3,4-B)PIPERAZINE

Rodney L. Willer, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 16, 1984, Ser. No. 600,708

Int. Cl.³ C07D *413/02, 498/04*

U.S. Cl. 544—367 **3 Claims**

1. 1,4-dinitrofurazano[3,4-b]piperazine

4,539,406

PREPARATION OF FUSED CARBOCYCLIC RING DERIVATIVES OF PYRIDINE

Roger Crossley, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

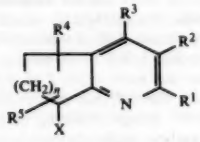
Filed Jun. 21, 1983, Ser. No. 506,278

Claims priority, application United Kingdom, Jun. 25, 1982, 8218464

Int. Cl.³ C07D *217/02, 219/06, 221/04, 221/06*

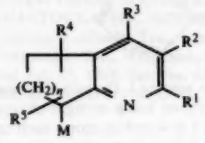
U.S. Cl. 546—14 **13 Claims**

1. A process for preparing compounds of formula I



I

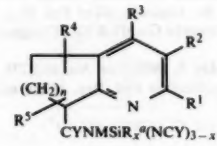
or acid addition salts thereof, wherein R^1, R^2, R^3, R^4 and R^5 are the same or different and represent hydrogen or alkyl of 1–6 carbon atoms, cycloalkyl of 4–6 carbon atoms, aralkyl of 7–12 carbon atoms, or phenyl groups, any of which groups may be substituted by alkyl of 1–6 carbon atoms, alkoxy of 1–6 carbon atoms, or trifluoromethyl; or R^1 and R^2 taken together, or R^2 and R^3 taken together, form a 5, 6 or 7 membered carbocyclic ring which may be saturated or unsaturated and when R^1 and R^2 form a ring, the ring has the same number of carbon atoms as the ring carrying X; R^4 and R^5 may also represent alkoxy of 1–6 carbon atoms; n is 1, 2 or 3; and X is CN, $CONH_2$, or $CSNH_2$; which process comprises treating a compound of formula II



II

wherein R^1, R^2, R^3, R^4, R^5 and n are as defined in connection with formula I, and M is sodium, potassium, lithium, or MgHal, where Hal is chlorine, bromine or iodine; with a silyl compound of formula III, $R^a_xSi(NCY)_{4-x}$ wherein R^a is selected from electron donating substituents consisting of alkoxy of 1–10 carbon atoms, cycloalkoxy of 4–8 carbon atoms, aralkoxy of 7–12 carbon atoms, phenoxy which may be substituted by alkyl of 1–10 carbon atoms, alkoxy of 1–10 carbon atoms, or trifluoromethyl, the group R^bR^cN- wherein R^b and R^c are selected from alkyl of 1–6 carbon atoms, cycloalkyl of 4–6 carbon atoms, phenyl which may be substituted by alkyl of 1–10 carbon atoms, alkoxy of 1–10 carbon atoms, or trifluoromethyl, and aralkyl of 7–12 carbon atoms or R^b and R^c may be joined to form a pyrrolidinyl or piperidinyl ring with the nitrogen atom which may be substituted by alkyl of 1–10 carbon atoms, alkylthio of 1–10 carbon atoms, cycloalkylthio of 4–8 carbon atoms, aralkylthio of 7–12 carbon atoms, phenylthio which may be substituted by alkyl of 1–10 carbon atoms, alkoxy of 1–10 carbon atoms, or trifluoromethyl, and hydrocarbon substituents selected from alkyl of 1–10 carbon atoms, cycloalkyl of 4–8 carbon atoms, aralkyl of 7–12 carbon atoms, or phenyl which may be substituted by alkyl of 1–10 carbon atoms, alkoxy of 1–10 carbon atoms, or trifluoromethyl, at least one group R^a being an electron donating substituent, Y is oxygen or sulphur, x has a value from 1 to 3, then subjecting the product to hydrolysis or alcoholysis, with the proviso that when a compound of formula I in which X is CN is desired the molar ratio of compound $R^a_xSi(NCY)_{4-x}$ to compound II is at least 2:1 and x is 3 and y is S and, if desired, isolating the product as an acid addition salt.

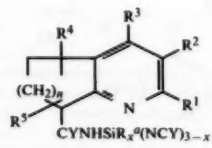
12. A compound of formula VI



VI

wherein R^1, R^2, R^3, R^4, R^5, R^a, n, x, Y and M are as defined in claim 1.

13. A compound of formula VII



VII

wherein R^1, R^2, R^3, R^4, R^5, R^a, n, x and Y are as defined in claim 1.

4,539,407

β-CARBOLINE ANTICONVULSANTS

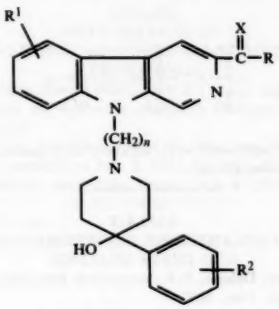
Gary P. Stack, Merion, and John A. Moyer, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 561,006, Dec. 13, 1983,. This application Jan. 31, 1985, Ser. No. 696,820

Int. Cl.[3] C07D *209/56*

U.S. Cl. 546—87 2 Claims

1. A compound having the formula



wherein

X is O, S or NHR^3, wherein R^3 is hydrogen, lower alkyl or cycloalkyl;

R is loweralkyl, loweralkoxy, aralkoxy of up to 10 carbon atoms or NR^4R^5 wherein R^4 and R^5 are, independently, hydrogen, lower alkyl, cycloalkyl or aminoalkyl; or R is alkoxymethyl or hydroxymethyl;

n is one of the integers 2, 3 or 4;

R^1 and R^2 are, independently, hydrogen, halo, nitro, cyano, SCH_3, or NR^6R^7, $NHCOR^6$, $COOR^6$, OR^6 or $SO_2NR^6R^7$ wherein R^6 and R^7 are independently hydrogen or loweralkyl.

4,539,408

PROCESS FOR THE PREPARATION OF SULPHOALKYL QUATERNARY SALTS

Helmut Kampfer, Cologne; Marie Hase, Berg.-Gladbach, and Max Glass, Cologne, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

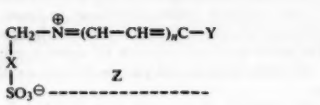
Filed Apr. 28, 1978, Ser. No. 901,208

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1978, 28034937

Int. Cl.[3] C07D *293/12, 285/00, 277/00, 263/00*

U.S. Cl. 546—139 7 Claims

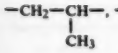
1. The process for the preparation of a compound of the following formula III



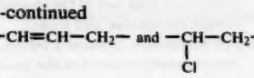
(III)

in which

X represents a bivalent group selected from the following: $-(CH_2)_m-$ in which m is an integer from 1 to 3,



-continued

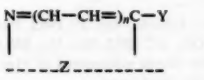


Z represents the atoms required for completing a heterocyclic group comprising at least one 5-membered or 6-membered heterocyclic ring which may have a benzene or naphthalene ring condensed to it, said heterocyclic ring being selected from the group consisting of pyrroline, oxazoline, thiazoline, selenazoline, imidazole, oxazole, thiazole, selenazole, 1,3,4-thiadiazole and pyridine

n=0 or 1,

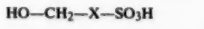
Y represents halogen, an unsaturated aliphatic group having up to 6 carbon atoms, an alkoxy group having up to 6 carbon atoms or mercapto, or when Z completes a heterocyclic group comprising at least one pyrroline, oxazoline, thiazoline, selenazoline, 1,3,4-thiadiazole, pyridine or condensed naphthalene ring, Y may also be selected from the group consisting of hydrogen, methyl and ethyl,

in which process a heterocyclic base of the following formula I



(I)

wherein Y, Z and n have the meanings already specified or a salt of such a base with an inorganic or organic acid is reacted with a hydroxyalkane sulfonic acid of a hydroxyalkene sulfonic acid corresponding to formula II



(II)

in which X has the meaning already specified or with a metal salt or this acid at a temperature between 140° and 200° C. and water of reaction is removed from the reaction mixture.

4,539,409

PROCESS FOR PREPARING AROMATIC NITRILES

Dietrich Arntz; Günter Prescher, both of Hanau; Werner Burkhardt, Brachttal; Johannes Heilos, Seligenstadt, and Reinhard Manner, Maintal, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 390,446, Jun. 21, 1982,. This application Oct. 18, 1983, Ser. No. 542,965

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125062

Int. Cl.[3] C07D *213/57;* C07C *120/14*

U.S. Cl. 546—286 2 Claims

1. In a process for preparing aromatic and heteroaromatic nitriles by ammoxidation of alkyl-substituted aromatic and heteroaromatic hydrocarbons,

the improvement which comprises using as the catalyst an abrasion-resistant coated catalyst formed of an inert support which has a rough surface and a particle size of 0.5 to 6 mm and a coating of active catalyst material enclosing this support and anchored in it,

said catalyst having been prepared by a process comprising agitating a bed of the inert support and spraying thereon a suspension of a precursor for said active catalyst material in a suspending medium while partially removing the suspending medium by a gas stream at a temperature of 20°–250° C., essentially constant residual moisture of the coating being maintained, drying and heat-treating

wherein a mixing motion is imparted to the support bed by mechanical action and the support bed is simultaneously loosened by blowing in from below a fluidizing, mixing-intensifying gas stream; said precursor being an oxidic powder composed of the oxides of antimony and vanadium in a ratio of 1.1:1 to 50:1 and which additionally

contains at least one of the elements iron, copper, titanium, cobalt, manganese and nickel,

which suspension contains a binder, and which suspension is passed countercurrent to the gas in this bed at a rate which increases with increasing thickness of the coating, the amounts of suspending medium drawn off and sprayed being maintained in a substantially constant ratio which is determined by the particular combination of support and precursor used,

the thermal expansion coefficients of support and of dried pulverulent oxidic precursor being so chosen that they differ by at most 15%,

and wherein after the spraying-on has been completed the coating is densified by continuing the increased mixing motion, the mechanical mixing motion is then stopped, the material is dried in a continuing gas stream and finally heat treated for 2–8 hours between 600° and 1100° C.

4,539,410

N-SUBSTITUTED-2-(1-IMIDAZOLYL)INDOLES

Harris B. Renfroe, West Nyack, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

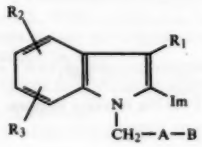
Continuation-in-part of Ser. No. 430,644, Sep. 30, 1982, Pat. No. 4,436,746. This application Dec. 27, 1983, Ser. No. 565,936

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.³ C07D *403/04*

U.S. Cl. 548—336 **9 Claims**

1. A compound of the formula



(I)

wherein R_1 represents hydrogen or lower alkyl; Im represents 1-imidazolyl unsubstituted or substituted by lower alkyl, carboxy, lower alkoxycarbonyl or carbamoyl; R_2 and R_3 independently represent hydrogen, lower alkyl, halogen, trifluoromethyl, hydroxy, lower alkoxy, lower alkyl-(thio, sulfinyl or sulfonyl); or R_2 and R_3 together when attached to adjacent carbons represent lower alkylenedioxy; A represents alkylene of 1 to 12 carbon atoms, alkenylene of 2 to 12 carbon atoms, alkynylene of 2 to 12 carbon atoms, lower alkylenephenylene-lower alkylene, lower alkylenephenylene, phenylene-lower alkylene, phenylene, a direct bond, lower alkylene-(thio or oxy)-lower alkylene, (thio or oxy)-phenylene, lower alkylene-(thio- or oxy)-phenylene, phenylene-(thio or oxy)-lower alkylene or phenylene-lower alkenylene; B represents hydroxycarbamoyl, 5-tetrazolyl or formyl; the N-oxide thereof; or a pharmaceutically acceptable salt thereof.

4,539,411

RHODIUM COMPLEXES OF CHIRAL PHOSPHINES

Emil A. Broger, Magden, and Yvo Crameri, Oberwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

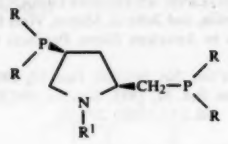
Filed Jan. 17, 1983, Ser. No. 458,418

Claims priority, application Switzerland, Feb. 5, 1982, 711/82; Dec. 2, 1982, 7010/82

Int. Cl.³ C07D *207/10*

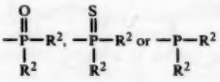
U.S. Cl. 548—402 **8 Claims**

1. A rhodium complex with a chiral phosphine of the formula



I

wherein R represents aryl and R^1 represents a group of the formula



in which R^2 represents aryl, di(lower alkyl)amino, hydroxy, aryloxy or lower alkoxy.

4,539,412

7-HYDROXYLUCANTHONE, 7-HYDROXHYCANTHONE AND THEIR ANALOGS

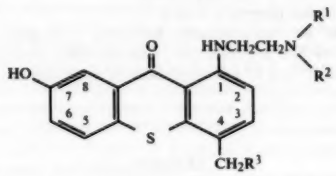
Sydney Archer, Delmar, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Continuation-in-part of Ser. No. 405,378, Jul. 8, 1982, abandoned, which is a continuation-in-part of Ser. No. 396,433, Aug. 5, 1982, abandoned. This application Feb. 1, 1984, Ser. No. 576,015

Int. Cl.³ C07D *311/86, 335/16*

U.S. Cl. 549—27 **15 Claims**

1. A compound having the formula



wherein:

R^1 and R^2 are individually selected from one of, methyl and ethyl;

R^3 is selected from one of a hydrogen atom and hydroxy.

11. A process for preparing the compound of claim 1 wherein R^1 and R^2 are methyl and R^3 is OH, comprising:

(a) mixing 5-methoxythiosalicylic acid with m-chloroiodobenzene under conditions to form 3-chloro-2-carboxy-4-methoxydiphenylsulfide;

(b) mixing the diphenylsulfide with polyphosphoric acid under conditions to form mixed 1-chloro-7-methoxythioxanthenones;

(c) mixing the mixed thioxanthenones with dimethylaminoethylamine and pyridine under conditions to form 1-(2-dimethylaminoethylamino)-7-methoxythioxanthenone;

(d) mixing the product of step (c) with HI under conditions to form 1-(2-dimethylaminoethylamino)-7-hydroxythioxanthenone;

(e) mixing the product of step (d) with pyridine and p-toluenesulfonyl chloride under conditions to form 1-(2-dimethylaminoethylamino)-7-toluenesulfonoxythioxanthenone;

(f) mixing the product of step (e) with formaldehyde and HOAc under conditions to form a residue;

(g) using an eluant to elute the compound; and

(h) hydrolyse the toluensulfonoxy esters to the desired product.

14. A process for preparing an intermediate for the prepara-

tion of the compound of claim 1 wherein R^1 and R^2 are methyl or ethyl and R^3 is OH, comprising:

(a) combining p-methoxythiophenol with 2,6-dichlorobenzonitrile, under conditions for form 2-chloro-6-(p-methoxybenzenethio)-benzonitrile;

(b) adding to the benzonitrile of step (a) triflouromethanesulfonic acid to form a mixture; and

(c) adding the mixture of step (b) to water to form 1-chloro-7-methoxythioxanthenone.

4,539,413

PREPARATION OF 3-AMINO-1-[(1,4-BENZODIOXAN)-2-YL-METHOXY]-2-PROPANOLS

Gilbert Mouzin; Henri Cousse, both of Castres, and Pol Vilain, Labruguiere, all of France, assignors to Pierre Fabre S.A., Paris, France

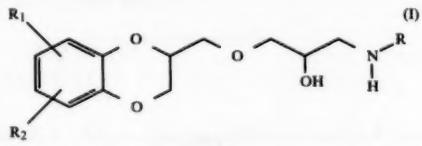
Division of Ser. No. 250,407, Apr. 2, 1981, Pat. No. 4,456,614. This application Jan. 3, 1983, Ser. No. 455,125

Claims priority, application France, Apr. 4, 1980, 80 07719

Int. Cl.³ C07D *319/14*

U.S. Cl. 549—366 **11 Claims**

1. A method of preparing a compound of the formula

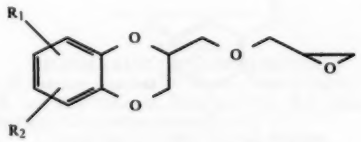


(I)

in which

R_1 and R_2 may be identical or different and represent a hydrogen or halogen atom or a lower alkyl, lower alkoxy, nitro or acetyl group, and

R represents a lower alkyl or lower aralkyl group, or a salt thereof with a therapeutically-acceptable inorganic or organic acid, characterized by the step of reacting a glycidyl ether of formula III

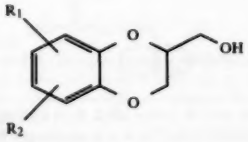


(III)

with a primary amine of formula IV

$$R—NH_2$$

in a solvent for the reaction, for a period of time and at a temperature sufficient to produce the desired compound of formula I, and also characterized by the additional step of first producing the glycidyl ether of formula III by reaction of a 2-hydroxymethyl-1,4-benzodioxan of formula II



(II)

in which R_1 and R_2 have the same meanings as those given in the foregoing, with epichlorohydrin in the presence of a base and in the presence of a catalyst of the quarternary ammonium type.

4,539,414

1H-CYCLOPENTA[B]BENZOFURAN DERIVATIVE AND ITS ANALOG

Ming L. King, 44-2, 25 Lung, 24-Hsiang, Section 4, Roosevelt Rd.; Chin-Chih Chiang, 4th Floor, No. 9, 44-Hsiang, Yu-Cheng Street; Han-Chin Ling, 3rd Floor, No. 24, 5-Lung, 626-Hsiang, Ting-Chou Rd., all of Taipei, Taiwan; Masahito Ochiai, 312, Kyoto University Shokuinshukusha, Gokanosho, Uji; Eiichi Fujita, 5-52, Fukakusananmei-cho, Fushimi, both of Kyoto, Japan, and Andrew T. McPhail, Durham, N.C.

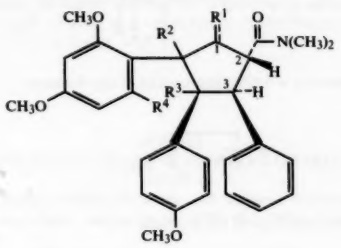
Filed Oct. 14, 1983, Ser. No. 542,140

Claims priority, application Japan, Apr. 14, 1985, 58-66280

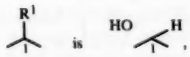
Int. Cl.³ C07D *307/93*; C07C *103/737*

U.S. Cl. 549—458 **3 Claims**

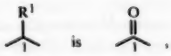
1. A substantially pure compound of the formula



wherein



R^2 is β-hydroxy and R^3 and R^4 together form an oxygen bridge, or



R^2 and R^3 together form an additional carbon-carbon bond, and R^4 is hydroxy.

4,539,415

PREPARATION OF 3-HYDROXYTETRAHYDROFURAN

Herbert Mueller, Frankenthal, and Dieter Voges, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 587,163

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1983, 3308931

Int. Cl.³ C07D *307/20*

U.S. Cl. 549—475 **3 Claims**

1. A process for the preparation of 3-hydroxytetrahydrofuran by the dehydration of butane-1,2,4-triol in a distillation vessel in the liquid phase over a catalyst at an elevated temperature, wherein a catalyst chosen from the group of the bleaching earths is used, wherein the dehydration is carried out in the presence of not less than 3 moles of water per mole of butane-1,2,4-triol and wherein a mixture of 3-hydroxytetrahydrofuran in water is distilled off and an aqueous solution of butane-1,2,4-triol, containing not less than 60% of water, is introduced at the same time to the distillation vessel.

4,539,416
PROCESSES FOR MAKING THIOALKYL CARBOXAMIDES AND AMINES

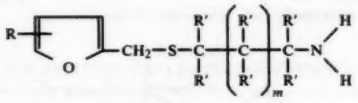
Harold G. Fravel, Jr., and Michael J. Fazio, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 10, 1983, Ser. No. 503,389
Int. Cl.³ C07D *307/52, 307/54*
U.S. Cl. 549—496 **13 Claims**

1. A process for making N-furfurylthioalkyl carboxamide by reacting an oxaz(ol)ine with a furfurylmercaptan in the absence of a transition metal catalyst to yield greater than 50 mole percent N-furfurylthioalkyl carboxamide based on either reactant.

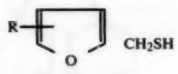
10. A process to form a furfurylthioalkylamine of the formula:

IV



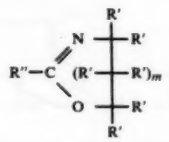
by contacting a furfurylmercaptan of the formula:

I



with an oxaz(ol)ine of the formula:

II



wherein R, R′ and R″ are each independently hydrogen, alkyl, alkenyl, aryl, aralkyl, alkylaryl, or one of these substituted with or interrupted by an oxygen, nitrogen or halogen atom, and m is zero or one, to form a N-furfurylthioalkyl carboxamide in the absence of a transition metal catalyst at a yield of greater than 50 mole percent N-furfurylthioalkyl carboxamide based on either reactant and then hydrolyzing the carboxamide to the amine.

4,539,417
POLY(DIMETHYLSILMETHYLENE) METHYLACETYLENE COMPOUND AND A METHOD FOR THE PREPARATION THEREOF

Minoru Takamizawa; Akira Yamamoto; Toshinobu Ishihara, and Mistuyoshi Ohshima, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Oct. 9, 1984, Ser. No. 658,597
Claims priority, application Japan, Oct. 11, 1983, 58-189540
Int. Cl.³ C07F *7/08*
U.S. Cl. 556—435 **5 Claims**

1. A poly(dimethylsilmethylene)methylacetylene compound represented by the general formula

$$MeC{\equiv}C{-}SiMe_2{-}CH_2{-}SiMe_2)_nMe,$$

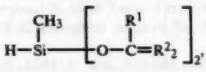
in which Me is a methyl group and n is a positive integer of 1 to 25.

4,539,418
METHOD FOR THE PREPARATION OF PENTAMETHYLCYCLOTRISILOXANE

Toshio Takago, and Masatoshi Arai, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 672,412
Claims priority, application Japan, Nov. 28, 1983, 58-223499
Int. Cl.³ C07F *7/08*
U.S. Cl. 556—451 **4 Claims**

1. A method for the synthetic preparation of pentamethylcyclotrisiloxane which comprises: admixing 1,1,3,3-tetramethyl-1,3-dihydroxy disiloxane and a methyl dialkenyloxysilane represented by the general formula



in which R^1 is an alkyl group having from 1 to 4 carbon atoms and R^2 is a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms to effect ring-closing reaction.

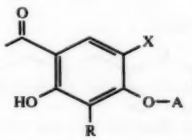
4,539,419
NAPHTHALENYLOXY SUBSTITUTED CARBOXYLIC ACIDS

Ronald A. LeMahieu, Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 2, 1983, Ser. No. 490,823
Int. Cl.³ C07C *69/76*
U.S. Cl. 560—053 **11 Claims**

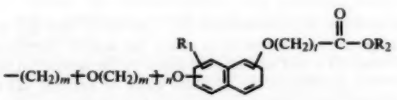
1. A compound of the formula

I



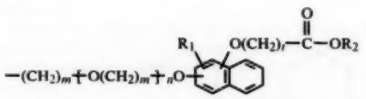
wherein R is hydrogen or lower alkyl, X is hydrogen or halogen, and A is the group

(a)



, or

(b)



wherein R_1 is hydrogen, acyl or lower alkyl, R_2 is hydrogen or lower alkyl, m is an integer from 2 to 4, n is an integer from 1 to 3, and t is an integer from 1 to 5, provided that R_1 is adjacent to $-(CH_2)_m[O(CH_2)_m]_nO-$, and, when R_2 is hydrogen, a salt thereof with a pharmaceutically acceptable base.

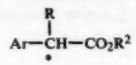
4,539,420

OPTICALLY ACTIVE 1-AROMATIC-GROUP-SUBSTITUTED-1-ALKANONES AND METHODS FOR THEIR MANUFACTURE

Gen-Ichi Tsuchihashi, Tokyo; Shuichi Mitamura, and Koji Kitajima, both of Kanagawa, all of Japan, assignors to Syntex Pharmaceuticals International Limited, Hamilton, Bermuda

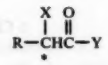
Filed Jun. 11, 1982, Ser. No. 387,585
Claims priority, application Japan, Jun. 15, 1985, 90978
Int. Cl.³ C07C 69/76
U.S. Cl. 560—056 8 Claims

1. A process for preparing an optically active alpha-aromatic group substituted alkanoic acid on its ester of the general formula:



(II)

wherein Ar represents an aromatic group, R represents a saturated aliphatic group, R^2 represents a hydrogen atom, an alkyl group or a hydroxyalkyl group, and * indicates an asymmetric carbon atom, or a pharmaceutically acceptable salt thereof, which comprises contacting an optically active alkane acid halide of the general formula:



wherein X is a halogen atom or a sulfonyloxy group, Y is a halogen atom and R and * are as defined above, with an aromatic compound of the general formula:

wherein Ar is defined as above, in the presence of a Lewis acid, and rearranging the resulting 1-aromatic-group-substituted-1-alkanone to the corresponding alpha-aromatic-group-substituted alkanoic acid or its ester, and optionally converting a compound of formula II to its pharmaceutically acceptable salt.

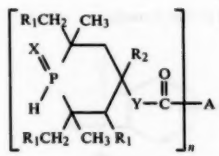
4,539,421

1H-POLYALKYL-PHOSPHORINANES

John D. Spivack; Stephen D. Pastor, both of Spring Valley, N.Y., and Paul Odorisio, Palisades Park, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 11, 1983, Ser. No. 540,238
Int. Cl.³ C07C 69/76
U.S. Cl. 560—105 16 Claims

1. A compound of the formula I



(I)

wherein

R_1 and R_2 independently are hydrogen or C_1–C_8 alkyl;

X is —O—, —S— or a lone pair of electrons;

Y is —O— or —N(R_3)— wherein R_3 is hydrogen or C_1–C_{12} alkyl;

n is 1 to 5 and

A is C_1–C_{18} alkyl, C_5–C_6 cycloalkyl, phenyl, phenyl substituted by C_1–C_4 alkyl and hydroxy, C_7–C_{10} aralkyl substituted by C_1–C_4 alkyl and hydroxy, C_2–C_{10} alkylene, cyclohexylene, C_6–C_{10} arylene substituted by C_1–C_4 alkyl, $N_{3.5}$-valent phenyl or cyclopentyl, pyridinyl, thienyl, picolyl, pyrrolidinyl, piperazinyl, pyrazinyl or piperidinyl.

4,539,422

PROCESS FOR PREPARING CEPHALOSPORIN INTERMEDIATES

Ian G. Wright, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 534,467, Sep. 21, 1983, abandoned. This application Feb. 22, 1985, Ser. No. 704,234
Int. Cl.³ C07C 69/003
U.S. Cl. 560—155 5 Claims

1. A process for preparing a C_3–C_8 alkyl cyanoformate comprising reacting about 1.0 equivalent of a C_3–C_8 alkyl haloformate in a suitable solvent with about 1.0 to 1.5 equivalents of an alkali metal cyanide in the presence of water and a catalytically sufficient amount of a quaternary ammonium phase transfer catalyst at a temperature in the range of from about 31 5° C. to about −25° C.

4,539,423

PROCESS FOR PREPARING DIESTERS OF MALONIC ACID

Hiroshi Itatani; Mikito Kashima, and Tsutomu Suehiro, all of Ichihara, Japan, assignors to UBE Industries Ltd., Ube, Japan

Filed Oct. 6, 1982, Ser. No. 433,045
Claims priority, application Japan, Oct. 15, 1981, 56-163487
Int. Cl.³ C07C 67/36
U.S. Cl. 560—204 21 Claims

1. A process for preparing diesters of malonic acid which comprises subjecting ketene, carbon monoxide and an ester of nitrous acid to a liquid phase homogeneous reaction in an organic solvent in the presence of a catalyst of a platinum group metal complex represented by the formula:

wherein, L represents a ligand selected from the group consisting of a triorganophosphines, triorganophosphites and triorganoarsines; M represents a platinum group metal; and X represents a halogen or an acetic acid ion.

4,539,424

PREPARATION OF LINEAR ESTERS BY CARBONYLATION OF MONOOLEFINS

Jean Jenck, Chalampe, France, assignor to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Oct. 19, 1983, Ser. No. 543,478
Claims priority, application France, Oct. 19, 1982, 82 17663
Int. Cl.³ C07C 67/38
U.S. Cl. 560—204 20 Claims

1. A process for the preparation of a linear carboxylic acid ester, comprising reacting an alcohol and carbon monoxide with a monoolefin, in the presence of cobalt and a tertiary nitrogen base, and in a reaction solvent which comprises a 5- or 6-membered monoheterocycle containing from 1 to 3 identical or different, non-adjacent oxygen or divalent sulfur heteroatoms, wherein said heterocycle can also contain from one to two carbon-carbon double bonds.

12. The process as defined by claim 1, wherein the starting material monoolefin comprises an alkyl pentenoate.

4,539,425

PROCESS FOR THE PREPARATION OF BENZOIC ACID

Ludovicus A. L. Kleintjens, Stein (L.), and Hubertus M. J. Grooten, Simpelveld, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Dec. 22, 1983, Ser. No. 564,198

Claims priority, application Netherlands, Jan. 3, 1983, 8300008

Int. Cl.³ C07C *51/255*

U.S. Cl. 562—412 8 Claims

1. In a process for the preparation of benzoic acid by the oxidation of toluene in the presence of a gas containing molecular oxygen yielding a reaction product containing impurities, the improvement essentially comprising extracting impurities from said reaction product, in solid or liquid form, with an extraction gas essentially consisting of at least one gas having a critical temperature lower than 435 K., by passing said extraction gas over or through said reaction product at a flow rate of at least 1 m^3 (NTP) gas per hour per kg benzoic acid for a time period of at least one minute, at a temperature within the range of between about 285 and 340 K. and at a pressure of at least 3 MPa.

4,539,426

ANTI-ARRHYTHMIC AGENTS

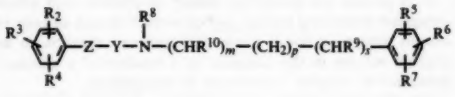
George C. Buzby, Jr., Blue Bell, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed May 11, 1984, Ser. No. 609,151

Int. Cl.³ C07C *143/72, 143/78, 143/80*

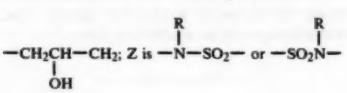
U.S. Cl. 564—92 17 Claims

1. A compound of the formula:



in which

Y is $-(CH_2)_n-$ where n is one of the integers 1, 2, 3 or 4 or



where R is hydrogen, alkyl of 1–6 carbon atoms, polyfluorinated alkyl of 1 to 6 carbon atoms, —CN, cyanoalkyl in which the alkyl moiety contains 1 to 3 carbon atoms, cycloalkyl of 3 to 6 carbon atoms or cycloalkylalkyl of 4 to 8 carbon atoms;

R^2, R^3, R^4, R^5, R^6 and R^7, independently, are hydrogen, alkoxy of 1–3 carbon atoms, trifluoromethyl, —Cl, —Br or —F;

R^8 is hydrogen or alkyl of 1 to 6 carbon atoms;

R^9 is alkyl of 1 to 3 carbon atoms;

R^{10} is alkyl of 1 to 3 carbon atoms;

m is one of the integers 0 or 1;

p is one of the integers 0, 1, 2 or 3; and

s is one of the integers 0 or 1;

or a pharmaceutically acceptable salt thereof, with the provisos that the sum of m, p and s must be 1, 2, 3 or 4; and the number of linear atoms in the bridge connecting the two aromatic rings does not exceed 8; and when n is 1 or 2, two of R^2, R^3 and R^4 are other than hydrogen.

4,539,427

PROCESS FOR THE PREPARATION OF FORMAMIDES

Michael J. Green, Hedon, England, assignor to BP Chemicals Limited, London, England

Filed Oct. 18, 1983, Ser. No. 543,092

Claims priority, application United Kingdom, Oct. 20, 1982, 8229989; Dec. 16, 1982, 8235844

Int. Cl.³ C07C *102/00, 102/06*

U.S. Cl. 564—132 8 Claims

1. A process for the preparation of formamides which process comprises reacting a primary amine or a secondary amine or ammonia with

(a) an alkyl formate or an aralkyl formate or

(b) carbon monoxide and an alkanol in the presence, as catalyst, of (i) a compound containing an amidine group or (ii) a Group V element-containing Lewis base and an epoxide promoter.

4,539,428

PREPARATION OF DIAMINODIPHENYL ETHERS

Philip H. Merrell, Arnold, and Michael F. Ellis, Hazelwood, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed May 10, 1982, Ser. No. 376,478

Int. Cl.³ C07C *85/11*

U.S. Cl. 564—430 6 Claims

1. A process for preparing a high-purity, 4,4'-diaminodiphenyl ether product containing above 98% of the 4,4'-diaminodiphenyl ether per se and having substantial freedom from pin tint which comprises (a) refluxing a reaction mixture comprising approximately equimolar amounts of (i) p-aminophenol, (ii) p-chloronitrobenzene, and (iii) potassium carbonate in a liquid medium comprising dimethylformamide, (b) hydrogenating the resulting mixture in the presence of a catalyst, (c) recovering the dimethylformamide by distillation, and (d) crystallizing the 4,4'-diaminodiphenyl ether product from the residue by cooling said reaction mixture in the presence of a precipitation-effective amount of an aliphatic alcohol selected from the group consisting of methanol, ethanol, and isopropanol.

4,539,429

SUBSTITUTED AMINOPHENYLALKYL KETONES, THEIR PREPARATION AND USE

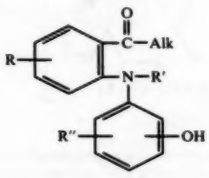
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,791

Int. Cl.³ C07C *87/50*

U.S. Cl. 514—658 7 Claims

1. A compound of the formula



wherein:

R is hydrogen, lower-alkyl, lower-alkoxy or halo;

R' is hydrogen or lower-alkyl;

R'' is hydrogen, lower-alkyl or halo; and

Alk is lower-alkyl.

4,539,430

PREPARATION OF ETHYLENEDIAMINE DINITRATE

Kien-yin Lee, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 17, 1984, Ser. No. 611,558
Int. Cl.[3] C07C 87/14
U.S. Cl. 564—511 7 Claims

1. A method for the preparation of ethylenediamine dinitrate which comprises the steps of:

a. forming an aqueous phase which includes nitrate ions in an acidic environment;

b. forming a liquid organic phase which includes at least one water-insoluble amine capable of extracting nitric acid from aqueous solution;

c. contacting said liquid organic phase with said aqueous phase for a time period sufficient to achieve significant extraction of said nitrate ions in an acidic environment by said water-insoluble amine producing thereby a nitrate salt of said amine, said salt being soluble in said liquid organic phase;

d. separating said aqueous phase from said liquid organic phase containing said nitrate salt of said amine, said aqueous phase being depleted in nitrate ions and an equivalent of hydrogen ions;

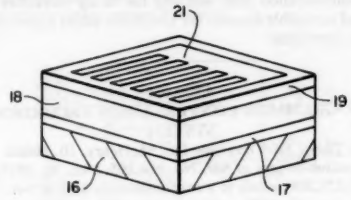
e. contacting said liquid organic phase containing said nitrate salt of said amine with ethylenediamine for a sufficient time period for substantial chemical reaction to occur, whereby ethylenediamine dinitrate is produced, the liquid organic phase becoming depleted in said nitrate salt of said amine; and

f. separating the ethylenediamine dinitrate from said liquid organic phase.

4,539,431
PULSE ANNEAL METHOD FOR SOLAR CELL

Garret R. Moddel, and James F. Gibbons, both of Palo Alto, Calif., assignors to Sera Solar Corporation, Santa Clara, Calif.

Filed Jun. 6, 1983, Ser. No. 501,601
Int. Cl.³ H01L *31/06, 31/18*
U.S. Cl. 136—258 3 Claims



1. The method of making a solar cell which comprises the steps of depositing on a substrate

a first layer of n-type amorphous silicon, followed by a second layer of amorphous silicon containing carbon atoms, followed by a third layer p-type amorphous silicon, and

annealing the entire structure by rapidly heating with radiant thermal energy for a short period of time, said carbon atoms minimizing crystallization of said second layer and maintaining high light absorption.

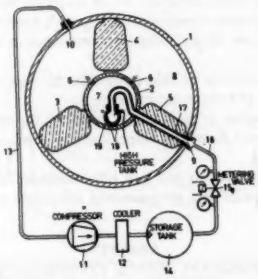
2. The method of claim 1 in which the first layer is formed by plasma decomposition of SiH_4 with 0.3% PH_3, the second layer by plasma decomposition of SiH_4 with 10% CH_4 and the third layer by plasma decomposition of SiH_4 and 0.3% B_2H_6.

3. A solar cell formed by the method of claim 2.

4,539,432
COOLABLE ELECTRICAL COMPONENT

Georg Köppl, Birr, and Gerhard Linhofer, Baden, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Switzerland

Filed Jan. 25, 1984, Ser. No. 573,520
Claims priority, application European Pat. Off., Jan. 27, 1983, 83200151.5
Int. Cl.³ H01B *7/34*
U.S. Cl. 174—15 C 10 Claims



1. Coolable electrical component, comprising:

an elongated, hollow conductor having an inner space and at least one orifice therethrough to allow said inner space to communicate outside said hollow conductor;

an outer housing surrounding and radially spaced from said hollow conductor and insulated therefrom, said outer housing defining an annular chamber between said outer housing and said hollow conductor and including an inlet opening and an outlet opening;

a high pressure vessel disposed within said hollow conductor, said high pressure vessel including an interior space within said vessel, an insulating fluid in said interior space of said vessel, means for connecting said interior space to said inlet opening of said outer housing, and at least one expansion nozzle in said high pressure vessel to allow said insulating fluid in said interior space of said vessel to communicate with and expand into said inner space of said conductor;

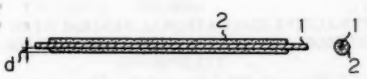
means for presssurizing and cooling said insulating fluid and for circulating said fluid through said inlet opening of said outer housing through said means for connecting said interior space to said inlet opening of said outer housing through the expansion nozzle to said inner space of said conductor through the said at least one orifice into said annular chamber and out of said housing through said outlet opening; and

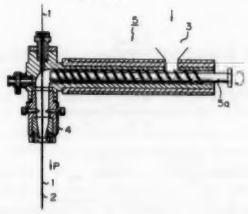
metering means coupled to said inlet opening for controlling the rate at which said insulating fluid flows through said inlet opening.

4,539,433
ELECTROMAGNETIC SHIELD

Ken Ishino; Yasuo Hashimoto, and Yoshikazu Narumiya, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 529,991
Claims priority, application Japan, Nov. 24, 1982, 57-204615; Feb. 28, 1983, 58-31045
Int. Cl.³ H05K *9/00*
U.S. Cl. 174—35 MS 10 Claims





1. A cloth electromagnetic shield, said shield comprising:

a flexible textile member which is substantially electrically conductive;

a ferrite layer deposited around said textile member, said ferrite layer being a mixture of ferrite powder and a binder for binding said ferrite powder so that the volume ratio of said ferrite powder to the mixture is in the range of 0.2 to 0.8, wherein said cloth is woven from said textile member.

4,539,434
FILM-TYPE ELECTRICAL SUBSTRATE CIRCUIT DEVICE AND METHOD OF FORMING THE DEVICE

Dennis L. Krause, Atkinson, N.H., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

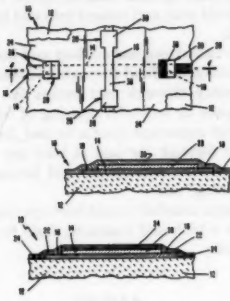
Filed Jul. 14, 1983, Ser. No. 513,565
Int. Cl.³ H05K *1/09, 1/16, 3/10*
U.S. Cl. 174—68.5 20 Claims

1. A method of forming a film-type electrical substrate circuit device, which comprises:

forming a film-type electrical conductor on a substrate;

forming a protective layer over a first portion of the film-type electrical conductor, such that at least a second portion of the film-type electrical conductor is exposed;

forming a cover film on the substrate, on the protective layer on the first portion of the film-type electrical conductor, and on the exposed portion of the film-type electrical conductor; and



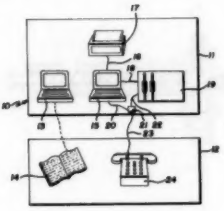
converting the cover film to an electrically-insulating protective film in a manner such that electrically conductive material in the portion of the film-type electrical conductor diffuses into an adjacent portion of the cover film to form an electrically conductive contact area in the electrically insulating protective film.

4,539,435

INTERACTIVE EDUCATIONAL SYSTEM WITH VOICE REACTION AND ACCESS USING TONE-GENERATING TELEPHONE

Stuart F. Eckmann, 806 Edgewood Dr., Charleston, W. Va.

Filed Jun. 14, 1982, Ser. No. 387,931
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 A **10 Claims**



1. A remote interactive communication system comprised of:

(a) a source location,

(b) a subject location remote from the source location,

(c) a telephone located at the subject location and adapted to generate a plurality of machine distinguishable signals,

(d) an interface unit located in the source location,

(e) a first communication link betwen the telephone and the interface unit,

(f) a programmable controller located at the source location,

(g) a second communication link between the interface unit and the controller,

(h) a storage unit which includes a plurality of magnetically encodable discs,

(i) a third communication link between the interface unit and the storage unit,

(j) a fourth communication link between the controller and the storage unit,

(k) a first initiating declaration file stored in the storage unit containing data adapted to be delivered in audible form to the telephone under supervision of the controller, the data including a response-inviting statement and a plurality of possible responses, each being associated with a different one of the machine distinguishable signals of the telephone, and

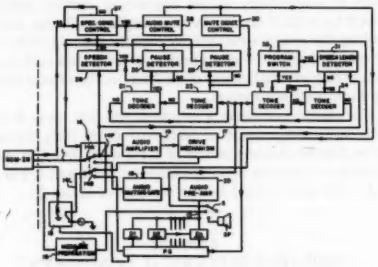
(l) a plurality of reaction files stored in the storage unit, one of which files represents and is associated by the controller with each of the machine distinguishable signals when that signal is generated by the telephone over the first communication link, said one file being thereafter delivered in audible form to the telephone under supervision of the controller.

4,539,436

PROGRAMMED CONVERSATION RECORDING SYSTEM

Peter F. Theis, 3203 Bayview La., McHenry, Ill. 60050

Continuation-in-part of Ser. No. 856,105, Nov. 30, 1977, Pat. No. 4,328,396, which is a continuation-in-part of Ser. No. 605,240, Aug. 18, 1975, , which is a continuation-in-part of Ser. No. 604,930, Aug. 15, 1975, , and Ser. No. 439,445, Feb. 4, 1974,. This application Dec. 24, 1981, Ser. No. 334,243
Int. Cl.³ H04M *1/64*
U.S. Cl. 179—6.04 **13 Claims**



1. Apparatus for carrying on a programmed telephone conversation with a respondent via a telephone line adapted to carry a voice communication of the respondent, the apparatus including means having a plurality of pre-recorded messages which are playable in sequence in response to a corresponding response from the respondent, and further comprising:

interface means for coupling said apparatus to the telephone line;

a speech detector coupled to the interface means;

detecting means, coupled to said speech detector, for detecting a pause in said voice communication of the respondent;

means, responsive to said pause, for causing the sending of the next pre-recorded message;

means, coupled to said speech detector, for detecting a lack of response from the respondent to a pre-recorded message; and

means responsive to said lack of a response, for also altering the course of said programmed telephone conversation.

4,539,437

STORED PROGRAM POWER CONTROL SYSTEM FOR IMPROVING ENERGY EFFICIENCY FOR TELEPHONE SETS CONNECTED INTO A LOCAL TELEPHONE COMMUNICATIONS SYSTEM

James N. Giacopelli, Flanders, N.J.; James D. McElroy, Allentown, Pa., and Thomas M. Taylor, Flanders, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 30, 1982, Ser. No. 445,845
Int. Cl.³ H04M *3/22, 19/00;* **H04Q** *3/54*
U.S. Cl. 179—18 ES **12 Claims**

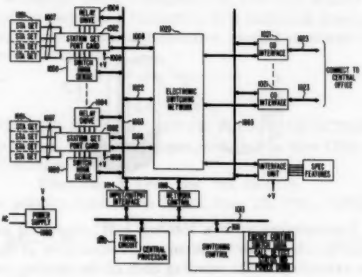
1. An energy management system for a telephone communications system comprising;

a switching network interconnecting a plurality of station sets to a central office, and

a central controller for controlling the switching network and associated interface circuits and further including energy control means for controlling energizing of individual station sets,

the energy control means comprising power down means for de-energizing inactive station sets,

the power down means including:



a first control means for establishing a count associated with each individual station set,

a second control means for periodically investigating the count and decrementing it while the station set is inactive, and

a third control means for de-energizing a station set when its associated count is fully decremented, and

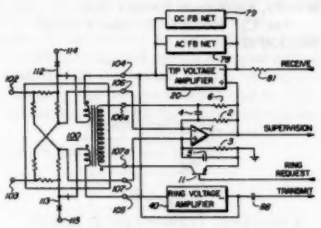
energizing means for restoring energy to de-energized station sets in response to indicia of activity.

4,539,438

ACTIVE IMPEDANCE TRANSFORMER ASSISTED LINE FEED CIRCUIT WITH SUPERVISION FILTERING

Stanley D. Rosenbaum, Ottawa, and Zdenek J. Holy, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 22, 1983, Ser. No. 525,398
Int. Cl.³ H04M *1/76, 19/00*
U.S. Cl. 179—18 FA **8 Claims**



1. A line circuit for terminating a two wire communciation line at tip and ring terminals, comprising:

a transformer having tip and ring primary windings and a secondary winding;

tip and ring feed resistors;

tip and ring amplifiers for supplying energizing currents for operation of the communication line, the tip and ring amplifiers having outputs being series connected to the tip and ring terminals via the tip and ring primary windings and the tip and ring feed resistors respectively;

a feed switch for conducting the energizing currents via the tip and ring feed resistors and the tip and ring primary windings, and being operable in response to a ring signal for conducting ring currents via the tip and ring feed resistors to the exclusion of the tip and ring windings;

a resistance network including tip and ring voltage taps, the resistance network being connected in combination with the tip and ring feed resistors for supplying voltage signals being indicative of currents in the tip and ring feed resistors at tip and ring voltage taps;

a control circuit being differentially responsive to the voltage signals at the tip and ring voltage taps and being responsive to a.c. signals from the secondary winding being coupled via a resistive capacitive network to an amplifier in the control circuit, for providing a supervisory signal for indicating the state of the communication line as being one of ON HOOK and OFF HOOK, and during the OFF HOOK state for providing a control signal for operation of the tip and ring amplifiers; and

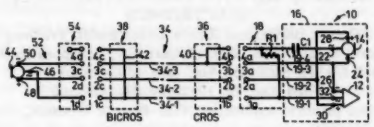
control switch means being responsive to the ring signal for open circuiting the secondary winding such that the amplifier in the control circuit in combination with the resistive capacitive network functions as a low pass filter to reduce a.c. signal components in the supervisory signal.

4,539,439

PLUGS, RECEPTACLES AND HEARING AIDS

Rolf Strothmann, Innerkip, and Rolf Dohmer, Kitchener, both of Canada, assignors to Unitron Industries Ltd., Kitchener, Canada

Filed Apr. 18, 1983, Ser. No. 485,912
Int. Cl.³ H04R *25/00*
U.S. Cl. 179—107 R **13 Claims**



1. An electrical connection cord having a first plug at one end thereof and a second plug at the other end thereof, said cord having a plurality of conductors joining the plugs, each plug having a plurality of contacts, the contacts of said first plug being connected to said conductors in a first circuit configuration, the contacts of said second plug being connected to said conductors in a second circuit configuration different from said first circuit configuration, the contacts of both said plugs being adapted to be plugged one plug at a time into a single receptacle, whereby an electrical connection to said receptacle may be varied dependent on which of said plugs is plugged into said receptacle.

4,539,440

IN-CANAL HEARING AID

Michael Sciarra, 59 Far Pond Rd., Southampton, N.Y. 11968

Filed May 16, 1983, Ser. No. 495,054
Int. Cl.³ H04R *25/00*
U.S. Cl. 179—107 E **10 Claims**

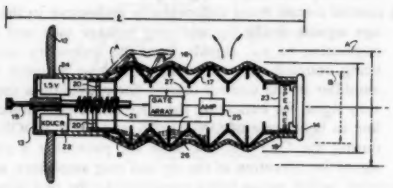
1. An in-canal hearing aid adapted to fit within the auditory canal of a wearer comprising

a generally cylindrical member including a resilient stretchable outer layer for contacting the walls of the auditory canal, and an adjustably expandable member disposed within said outer layer for changing the diameter of said outer layer without significantly changing the length of the cylindrical member;

hearing aid amplifying means disposed within said generally cylindrical member and including power source means, audio amplifier means, an input audio transducer disposed at one end of said generally cylindrical member and coupled to an input of said audio amplifier means, an output

audio transducer disposed at the other end of said generally cylindrical member and coupled to an output of said audio amplifier means, and means for adjusting the gain of said audio amplifier means; and

adjusting means extending from the one end of said generally cylindrical member for selectively expanding said adjustably expandable member such that the generally cylindrical member fits snugly in the wearer's auditory canal; said generally cylindrical member being flexibly hinged to permit axial flexing, such that the hearing aid can accommodate the curvature of the auditory canal.



4,539,441

HEARING-AID WITH INTEGRATED CIRCUIT ELECTRONICS

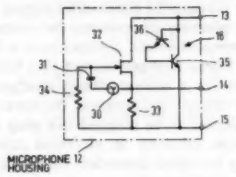
Albert Eggert, Berlin, and Rainer Goldschmidt, Freiburg-Munzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,560

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 3134888

Int. Cl.³ H04R *3/00*

U.S. Cl. 179—111 E **13 Claims**



1. A miniaturized, battery-weakening-compensated hearing-aid device (10) including

a microphone (11);

a microphone housing structure (12) within the hearing-aid device (10);

a sound amplifier (20,23) to amplify the electric signal from the microphone;

an earphone (22) receiving the amplified signals from the sound amplifier;

a current supply battery (18) powering the hearing-aid device; and

means for compensating for decreases in the output voltage of said battery as it ages and weakens;

wherein, in accordance with the invention, said compensating means comprises an integrated voltage stabilizer circuit (16) located, for miniaturization purposes, within the microphone housing (12) of the microphone and connected in parallel to the microphone (11).

4,539,442

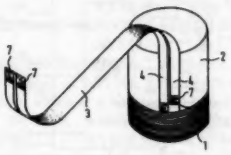
LOUDSPEAKER

Bernhard Puls, Mitterfels; Hermann Gruber, Hunderdorf; Kurt Leipold, Feldkirchen; Richard Schonberger, Straubing; Ulrich Kizak, Oberwinkling, and Max Huttereer, Straubing-Kagers, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,876

Int. Cl.³ H04R *9/04*

U.S. Cl. 179—115.5 VC **7 Claims**



1. Loudspeaker with a moving coil connected to a diaphragm in which elastic ribbon conductors serve as the lead in wires extending to the winding ends of the moving coil, with each ribbon conductor being connected on the one hand, to the moving coil and, on the other hand, to a stationary part of the loudspeaker, characterized in that the moving coil (1) is disposed on a portion of the longitudinal dimension of a cylindrical moving-coil carrier (2), with at least two flexible ribbon conductors (4) mounted on a plastics carrier (3) being disposed on the remaining portion of the moving-coil carrier parallel in relation to the longitudinal axis thereof, with the ends of said ribbon conductors being secured to said moving-coil carrier (2) with the aid of a thermosetting adhesive film (6), and that the ends of said moving coil are connected in an electrically conductive manner to these ends of said ribbon conductors.

4,539,443

DIRECT CURRENT MAGNETIZED HYBRID TRANSFORMER

Ivan Jaki, Norsborg, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

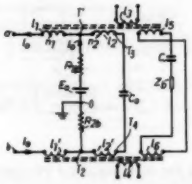
PCT No. PCT/SE82/00112, § 371 Date Dec. 6, 1982, § 102(e) Date Dec. 6, 1982, PCT Pub. No. WO82/03738, PCT Pub. Date Oct. 28, 1982

PCT Filed Apr. 6, 1982, Ser. No. 448,908

Claims priority, application Sweden, Apr. 24, 1981, 8102610

Int. Cl.³ H04B *1/58*; H04M *19/00*

U.S. Cl. 179—170 D **1 Claim**



1. A direct-current magnetized hybrid transformer adapted for being included in a repeater for a telephone line to provide a two-wire to four-wire coupling in the repeater, said line having a determinable line impedance, said transformer comprising a first primary winding, a first pair of secondary windings magnetically coupled to said first primary winding, a second primary winding, a second pair of secondary windings magnetically coupled to said second primary winding, a balancing impedance, the first and second pairs of secondary windings creating a four-wire path, at least one winding from

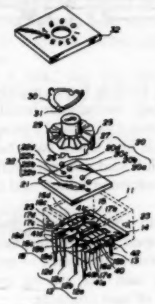
each pair being connected to said balancing impedance said balancing impedance being matched to the line impedance, said first and second primary windings each including two winding parts, each primary winding having a number of turns such that the number of turns of one of said winding parts is in a determined relation to the number of turns of the other of said winding parts, a common connection point between the parts of each said primary winding, a feeding source means connected between the connection points and magnetizing only one of the winding parts of both the first and second primary windings, and a capacitor, the first and second primary windings including respective first terminals connected to said telephone line and respective second terminals connected by said capacitor.

4,539,444

SIMPLIFIED ELECTRIC SWITCH CONSTRUCTION

Yasutaka Senoh, Yokohama, Japan, assignor to New Ohto Co., Ltd., Yokohama, Japan

Filed Jan. 3, 1984, Ser. No. 567,778
Claims priority, application Japan, May 25, 1983, 58-92094
Int. Cl.³ H01H *1/18*
U.S. Cl. 200—5 R **4 Claims**



1. An electric switch construction comprising:

(a) at least a pair of confronting first and second terminals each having a bridge portion;

(b) a conductive resilient plate having one end shaped as a pyramid disposed in confronting relation to the bridge portion of said first terminal and an opposite end connected to the bridge portion of said second terminal;

(c) a presser for depressing an intermediate portion of said resilient plate to bring said pyramid-shaped end into point to point contact with the bridge portion of said first terminal and for causing said pyramid-shaped end to slide across the contacted surface of the bridge portion of said first terminal; and

(d) a driver for depressing said presser.

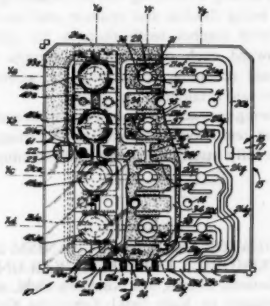
4,539,445

CLICK DISC SWITCH ASSEMBLY

Gary D. Jabben, Shreveport, La., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Continuation-in-part of Ser. No. 451,358, Dec. 20, 1982, Pat. No. 4,461,934. This application Dec. 23, 1983, Ser. No. 564,961
Int. Cl.³ H01H *13/70*
U.S. Cl. 200—5 A **7 Claims**

1. The improvement in a click disc assembly comprising: a printed wiring board including an electrically insulative base member and a plurality of first and of second electroconductive paths on such member corresponding to the rows and columns, respectively, of an X-Y matrix of contact pads disposed such that the pads in each X row thereof are parts of a respective one of said first paths, an array of metal electroconductive strips overlying such member so that the centerline of each such strip registers with the contact pads in a respective one of the Y columns of such pads, each such strip having formed therein a plurality of click discs each adapted by depression to engage a corresponding contact pad in the Y column corresponding to that strip, an insulating layer interposed between said strips and base member and having apertures for passage therethrough of said click discs, and a sealing sheet covering said strips and having on its underside an adhesive layer, said improvement comprising the features that: said strips are fixed in their positioning in the X and Y directions of said matrix only by a bonding of such strips by said adhesive layer to the underside of said sealing sheet, and said assembly



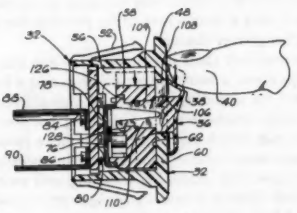
further comprises a plurality of third electroconductive paths each corresponding to a respective one of said Y columns, each of said third paths (a) being disposed on said insulating layer and, at least in part, beneath the strip registering with the Y column corresponding to that path, and (b) having a junction portion which passes through an aperture in said insulating layer to join with the second path corresponding to such Y column so as to electromechanically couple such third and second paths together, and each such third path (c) being thereby adapted upon at least depression of any of the click discs in the corresponding strip to electrically couple such disc to the second path corresponding to that strip.

4,539,446

SLIDE ACTION SWITCH

Andrew F. Raab, Morton Grove, and Albert R. Cobb, III, Glenview, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Filed May 29, 1984, Ser. No. 615,036
Int. Cl.³ H01H *15/06*
U.S. Cl. 200—16 R **18 Claims**



1. An electrical switch, comprising

a casing,

a carriage mounted in said casing for sliding movement along a predetermined path,

an electrically conductive contactor mounted on said carriage,

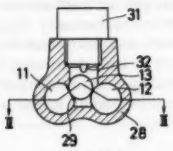
electrical contact means on said casing and selectively engage-

able by said contactor during movement thereof with said carriage along said path,
said casing having a front wall with a rearwardly facing surface along which said carriage is slidable,
said casing having a slot extending through said front wall and generally parallel with said path of said carriage,
said front wall having a front surface,
and an operating member slidable along said front surface of said front wall,
said operating member comprising a rearwardly extending portion including a pair of prongs extending through and slidable along said slot,
said carriage having a retaining slot for receiving said prongs,
said prongs being flexible and resilient and having rear end portions with ratchet teeth thereon for deflecting said prongs toward each other as said prongs are inserted through said retaining slot during the assembly of said prongs into said retaining slot,
said prongs being operative to snap away from each other with said ratchet teeth locked behind said carriage when said prongs are fully inserted through said retaining slot in said carriage.

4,539,447
INDICATOR SWITCH MECHANISM FOR AUTOMOBILE TRANSFER GEAR UNITS

Hiroyuki Mizutani, Chiryu, and Kunihiko Ochi, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

Filed Sep. 28, 1983, Ser. No. 536,494
Claims priority, application Japan, Oct. 5, 1982, 57-174987; Nov. 9, 1982, 57-197364
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.91 **8 Claims**

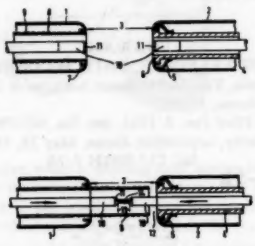


1. A transfer gear unit for use in an automobile, comprising:
(a) a first changeover device for selecting one of a two-wheel drive mode and a four-wheel mode at a time;
(b) a second changeover device for selecting one of a high-speed gear train, a neutral gear train and a low-speed gear train at a time;
(c) a first fork shaft selectively movable into a two-wheel drive position and a four-wheel drive position for actuating said first changeover device;
(d) a second fork shaft selectively movable into a high-speed gear position, a neutral gear position and a low-speed gear position for actuating said second changeover device; and
(e) a switch mechanism for indicating the four-wheel drive mode, said switch mechanism including a switch and switch actuator means operable in response to operation of said first and second fork shafts for actuating said switch when said first fork shaft is in said four-wheel drive position and said second fork shaft is in said high-speed gear position or said low-speed gear position, wherein said switch actuator means comprises a ball for acting on said switch, said first fork shaft having a recess for retracting said ball away from said switch when said first fork shaft is in said two-wheel drive position, said second fork shaft having a recess for retracting said ball away from said switch when said second fork shaft is in said neutral gear position.

4,539,448
DISCONNECT SWITCH FOR METAL-CLAD, PRESSURIZED-GAS INSULATED, HIGH-VOLTAGE SWITCHGEAR INSTALLATION

Winfried Schulz, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 30, 1984, Ser. No. 646,434
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1983, 3331819
Int. Cl.³ H01H *33/16*
U.S. Cl. 200—144 AP **27 Claims**



1. A disconnect switch for a metal-clad, pressurized-gas insulated, high voltage switchgear installation, comprising:
a first and a second cylindrical contact having a common longitudinal axis and being switchable between an open position at which said contacts define an isolation space and a closed position at which said contacts are in electrical contact,
at least one of said contacts being movable along said axis between said open position and said closed position, an isolating tube positioned inside of one of said contacts and movable along said axis during switching toward and from the other of said contacts,
said isolating tube bridging the isolation space between said contacts as long as one of the contacts is moved,
a first and a second resistance positioned and movable on said axis during switching, each resistance being of approximately the same size, electrically connected or connectable to one of the contacts,
said first and second resistance having external dimensions which are smaller than the internal diameter of said isolating tube,
said resistances being introduced into the isolation space at the start of the switching operation bridging said isolation space after the at least sufficient bridging of the isolations space by the isolating tube before said opposed first and second contacts come into contact with each other.

4,539,449
DISCONNECT SWITCH

Dieter Lorenz, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

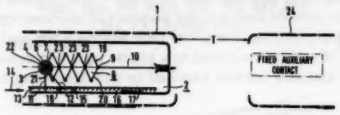
Filed Jul. 8, 1982, Ser. No. 396,383
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127967
Int. Cl.³ H01N *33/42, 33/12*
U.S. Cl. 200—146 R **7 Claims**

1. A disconnect switch comprising:
a stationary outer part;
a fixed tubular contact, spaced apart from the stationary outer part;
a fixed auxiliary contact connected to the fixed tubular contact;
a movable tubular contact guided in the stationary outer part and movable into connection with the fixed tubular contact;

a movable auxiliary contact disposed in the movable tubular contact to move into connection with the fixed auxiliary contact;

a support shaft coupled to the movable tubular contact;

a first sleeve rotatably mounted on the support shaft;



a pantograph-like connecting member having one end connected on the outside of the sleeve and the other end connected to the movable auxiliary contact; and

a mechanical control mounted on the outside of the sleeve and responsive to motion of the movable tubular contact to rotate the sleeve.

4,539,450

DISCONNECT SWITCH

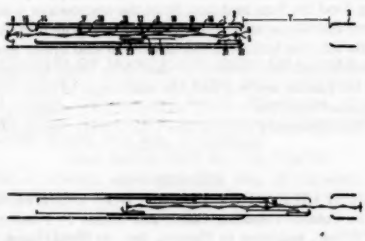
Dieter Lorenz, and Benno Rehaag, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,163

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127960

Int. Cl.³ H01H *33/42*

U.S. Cl. 200—148 F **3 Claims**



1. A disconnect switch comprising:

a fixed tubular contact coupled to a fixed auxiliary contact;

a movable contact tube guided in a stationary outer part, the movable contact tube spaced apart from the fixed tubular contact and comprising a forward end, adapted to connect with the fixed tubular contact, and a rear end;

a movable auxiliary contact disposed within the movable contact tube and comprising a forward end, adapted to connect with the fixed auxiliary contact, and a rear end;

a first catch at the forward end of the movable auxiliary contact;

a first pawl at the forward end of the movable tubular member, the first pawl cooperating with the first catch;

a second catch at the rear end of the movable auxiliary contact;

a second pawl supported on the stationary outer part, the second pawl cooperating with the second catch;

a control member disposed in the movable tubular contact tube and movable longitudinally therein to release either one of the pawls;

a first spring between the control member and the first latch;

a second spring between the control member and the second latch; and

a reduction drive coupling the control member to the movable tubular contact.

4,539,451

SWITCH

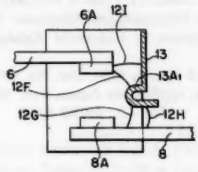
Teijiro Mori, Nishinomiya; Yuichi Wada, Kawanishi; Shizutaka Nishisako, Tajimi; Hiroaki Tazawa, Nagoya, and Shigeru Masuda, Ichinomiya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,675

Claims priority, application Japan, Nov. 10, 1982, 57-197057; Nov. 10, 1982, 57-197060; Dec. 3, 1982, 57-212273; Dec. 3, 1982, 57-212284; Dec. 3, 1982, 57-212285; Dec. 22, 1982, 57-225313; Dec. 22, 1982, 57-225314; Dec. 22, 1982, 57-194397[U]; Feb. 16, 1983, 58-23977

Int. Cl.³ H01H *33/10*

U.S. Cl. 200—147 R **12 Claims**



1. A switch comprising:

fixed contact means;

movable contact means adapted for movement to come into contact with said fixed contact means and to go out of contact with the same such that a first gap is defined therebetween; and

an arc deflecting plate of magnetic metal provided generally in parallel with said movement, said arc deflecting plate being formed with a U-shaped tongue-like bent portion in proximity to said fixed contact means, said fixed contact means including a fixed contact plate and a fixed contact affixed to said fixed contact plate at an end portion thereof, said fixed contact plate extending in a direction generally perpendicular to said arc deflecting plate to define a second gap therebetween, said U-shaped portion having an outer bottom portion in facing relation to a selected one of said first and second gaps.

4,539,452

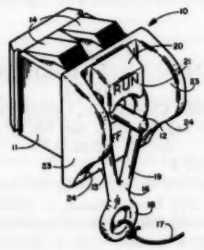
SAFETY STOP SWITCH ASSEMBLY

James R. Draxler, Fond du Lac, and Richard H. Snyder, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Dec. 27, 1983, Ser. No. 565,423

Int. Cl.³ H01H *3/36*

U.S. Cl. 200—334 **8 Claims**



1. A safety stop switch assembly comprising:

(A) a base having a hole therethrough;

(B) a switch attached to said base for controlling an electri-

cally operated device, said switch including an actuator arm for operating said switch between an on and on off position, said actuator arm extending through said hole and having a pivot axis below the surface of said base;

(C) a clip encircling said actuator arm; and

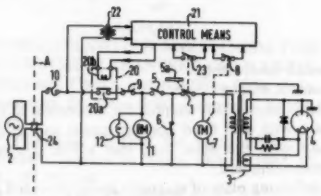
(D) an attachment means for releasably attaching said clip to said base and holding said clip in position encircling said actuator arm regardless of the position of said actuator arm and permitting operation of said actuator irrespective of the presence of said clip, said attachment means holding said clip adjacent said actuator arm to prevent removal of said clip without moving said actuator arm to the off position.

4,539,453

CONTROL CIRCUIT FOR A MICROWAVE OVEN

Koichi Miyazaki, Shizuoka, and Masayuki Aoki, Nagoya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Apr. 6, 1984, Ser. No. 597,424
Claims priority, application Japan, Jun. 10, 1983, 58-103654
Int. Cl.³ H05B 6/68
U.S. Cl. 219—10.55 C **9 Claims**



1. A control circuit for a microwave oven comprising:

(a) a start switch mechanically interconnected to a latching assembly of a microwave oven door, said start switch opening upon opening of said microwave oven door,

(b) means for energizing a magnetron of said microwave oven,

(c) a relay contactor connected between said energizing means and a power source, said relay contactor closing to connect said power source to said energizing means, and

(d) control means responsive to said start switch and operative upon connecting of said power source to said control circuit for determining the state of said start switch and for closing said relay contactor upon determining that said start switch is again closed only if said start switch was previously closed, then opened, and again closed wherein opening of said microwave oven door also opens said start switch,

whereby upon power-up of said control means, said microwave oven door must be opened and then reclosed if said start switch is initially closed to encourage an operator of said oven to place food products therein prior to energizing said magnetron megatron of said microwave oven.

4,539,454

METHOD AND MEANS FOR IMPROVING MICROWAVE COOKING

Roger Yangas, 14000 Citation Dr., Orland Park, Ill. 60642

Filed Sep. 21, 1984, Ser. No. 652,897
Int. Cl.³ H05B 6/64
U.S. Cl. 219—10.55 F **7 Claims**

1. A power heat cell for increasing the cooking rate of food in a microwave oven having means to produce microwaves, said power cell comprising a lower hollowed out housing of styrofoam having a bottom wall, a flexible pouch housed within said hollowed out portion, a porous sponge therein, a small amount of water in said sponge, an upper, substantially square in horizontal cross-section, styrofoam housing having a medial through aperture therein and having a top, side and bottom walls, the bottom wall of said upper member being partially hollowed out, four aluminum mirror-like pieces each of truncated triangular shape each extending upwardly from said top substantially less than vertical and pivoted to the top wall of said upper member adjacent the respective side walls and away from said top wall, each piece spaced from adjacent pieces to prevent arcing in the presence of microwaves, a clear plastic top plate, an aluminum tube having a top and bottom, the top of said tube secured to a plastic square in cross-section portion and said portion attached to and depending from said

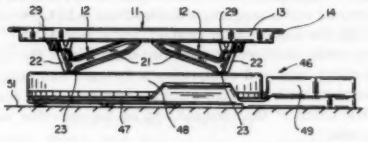
plate, said portion extending through said aperture in said upper member with the bottom portion of said tube extending partially in said flexible pouch and sponge whereby when cooking food the heat and rays from the microwave will heat the water quickly in said pouch causing said pouch to expand upwardly into the hollowed out bottom of said upper member and causing said four aluminum shields to close horizontally against the plastic top, but with the side edges of each triangle being spaced from each other, and to redirect microwaves to reflect heat upwardly to cook the food evenly and quicker.

4,539,455

ADJUSTABLE SHELF FOR MICROWAVE OVENS

Albert E. Colato, Valencia, Calif., and James F. Pomroy, St. Paul, Minn., assignors to Plastics, Inc., St. Paul, Minn.

Filed Apr. 14, 1983, Ser. No. 484,851
Int. Cl.³ H05B 6/64
U.S. Cl. 219—10.55 E **13 Claims**



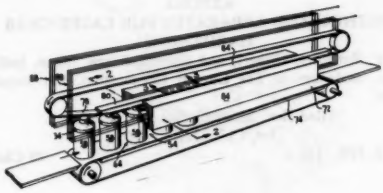
1. A shelf for use in a microwave oven cavity comprising a horizontally extending platform, a plurality of legs which depend from the platform and rest upon a supporting surface in the oven cavity, each of said legs having two sections of different lengths extending in different directions, means pivotaly connecting the legs to the platform and permitting movement of the legs between two predetermined positions in which the platform is supported at different heights above the supporting surface by respective ones of the leg sections, and detent means comprising a resilient detent arm carried by the platform and a pair of detent sockets mounted on each of the legs in position for engagement by the detent arm when the legs are in respective ones of the predetermined positions.

4,539,456

INDUCTION HEATING SYSTEM AND METHOD OF BONDING CONTAINER END UNIT TO BODY UTILIZING THE SAME

Glenn R. Mohr, Linthicum, Md., assignor to Continental Can Company, Inc., Stamford, Conn.

Filed Feb. 10, 1983, Ser. No. 465,416
Int. Cl.³ H05B 6/40
U.S. Cl. 219—10.69 8 Claims



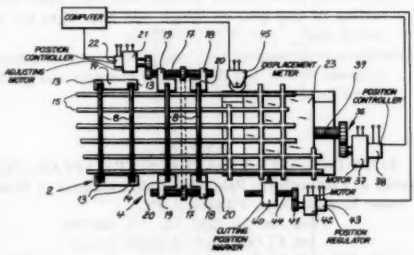
1. An inductance heating apparatus for heating moving cylindrical surfaces, said apparatus comprising conveyor means for moving cylindrical surfaces along a preselected path, conductors positioned along said path, said conductors being of an angular cross section and each conductor having a first portion positioned to be disposed alongside a moving cylindrical surface and a second portion positioned to overlie a portion of the same moving cylindrical surface, said conductors each being a portion of a coil, and a source of high frequency electrical energy coupled to said conductors, each of said conductors including a lower third conductor portion extending from said first conductor portion in a direction generally opposite to that of said second conductor portion.

4,539,457

METHOD OF MANUFACTURING GRATINGS AND APPARATUS FOR CARRYING OUT THE METHOD

Egon Pinger, Penzberg, and Jan W. Stapelmann, Meerbusch, both of Fed. Rep. of Germany, assignors to Staco Stapelmann GmbH, Kaarst, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,774
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245179
Int. Cl.³ B23K 11/02, 11/32
U.S. Cl. 219—58 18 Claims



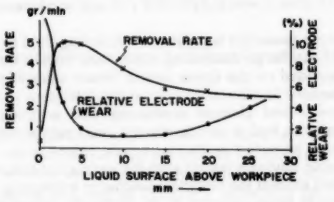
1. A method of continuously manufacturing gratings comprising longitudinal support bars and transverse bars welded thereto at substantially equal spacings along the longitudinal support bars and wherein said longitudinal bars project at each end beyond the adjacent transverse bar, said method including the steps of providing a plurality of longitudinal support bars spaced laterally apart, positioning and welding transverse bars at least one at a time to said plurality of longitudinal bars at a stationary welding station while maintaining said longitudinal and transverse bars stationary, advancing said longitudinal bars with said welded transverse bars after each welding step for a given longitudinal spacing until the next at least one transverse bar is in the welding station and stopping the movement of said longitudinal bars, providing computer control means, and controlling said positioning and advancing steps by said computer control means so as to control the spacing between successive transverse bars whereby, for a grating of a predetermined length, said transverse bars are substantially evenly spaced at a pitch which is within a predetermined tolerance of a predetermined basic pitch and said longitudinal bars project at each end by a predetermined amount from the adjacent said transverse bar.

4,539,458

NON-IMMERSION EDM METHOD AND APPARATUS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Incorporated, Yokohamashi, Japan

Filed Nov. 9, 1982, Ser. No. 440,320
Claims priority, application Japan, Nov. 11, 1981, 56-181567; May 21, 1982, 57-87134
Int. Cl.³ B23P 1/08/1, 16
U.S. Cl. 219—69 M 15 Claims



8. An EDM method of machining an electrically conductive workpiece to form a cavity therein, comprising the steps of:

spacedly juxtaposing a tool electrode with the workpiece to define an EDM gap therebetween so as to be substantially contiguous to atmospheric air in a working receptacle, said tool electrode having a machining surface complementary in shape with said cavity and being of an area in excess of 2 cm^2;

supplying into said EDM gap a water-based dielectric liquid consisting of 0 to 5% by weight at least one hydrocarbon, 1 to 5% by weight at least one organic substance other than hydrocarbons and the balance essentially deionized water;

while replenishing said water-base dielectric liquid into said EDM gap as slow a volume flow rate as up to 100 cc/min and maintaining said liquid-replenished EDM gap substantially contiguous to the atmospheric air in said receptacle, effecting a succession of electrical discharges between said tool electrode and said workpiece across said gap to electro-erosively remove material from the workpiece and to allow gap discharge products to scatter into said atmospheric air; and

relatively displacing said tool electrode and said workpiece while maintaining said EDM gap substantially constant to advance the erosive removal in said workpiece.

12. The method defined in claim 7, claim 8, or claim 9 wherein said organic substance is a non-ionic surface active agent.

4,539,459

NOZZLE AND POWER-FEED ELEMENT FOR WIRE-CUT ELECTRICAL DISCHARGE MACHINE

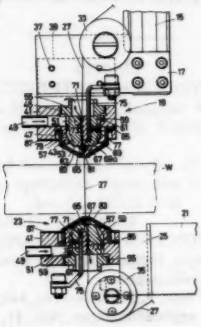
Toshitaka Yamagata, Tokyo, Japan, assignor to Amada Company, Limited, Japan

Filed May 18, 1983, Ser. No. 495,616

Claims priority, application Japan, May 19, 1982, 57-83257; May 19, 1982, 57-71916[U]

Int. Cl.[3] B23P *1/08, 1/16*

U.S. Cl. 219—69 W 6 Claims



1. A wire-cut electrical discharge machine which effects an electrical discharge machining of a workpiece by generating electrical discharges between a wire electrode continuously supplied from a wire supply unit and said workpiece, comprising:

a nozzle means for supplying a machining fluid to an electrical discharge machining zone, said nozzle means being provided on the upper and/or lower sides of said workpiece;

a power-feed element contacting said wire electrode in order to feed a current thereto, said power-feed element being provided inside said nozzle means; and

a nozzle having a nozzle port for jetting out said machining fluid toward the electrical discharge machining zone, said nozzle being adapted to be vertically movable with respect to the power-feed element by means of the pressure of said machining fluid.

4,539,460

METHOD OF HARDFACING VERTICAL WALLS

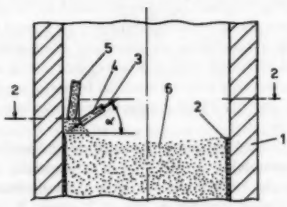
Bodo Herrmann, Bottrop; Paul Bastel, and Selahattin Bas, both of Oberhausen, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,089

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225125

Int. Cl.[3] B23K *9/18*

U.S. Cl. 219—73.21 2 Claims



1. A method of hardfacing vertical walls of a workpiece comprising building up a layer of superimposed partly overlapping horizontal weld beads by depositing the beads in a submerged arc welding operation using a welding wire and welding powder, supplying the welding powder as the welding wire is fed to the weld bead using a powder feed to submerge the arc welding, and accumulating the welding powder in the workpiece being formed up to the arc welding so as to support the powder which is beind fed to the arc weld.

4,539,461

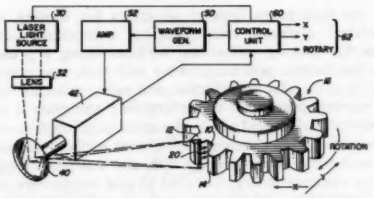
METHOD AND APPARATUS FOR LASER GEAR HARDENING

Gary F. Benedict, Gilbert, and Jim Eskildsen, Mesa, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 21, 1983, Ser. No. 563,894

Int. Cl.[3] B23K *27/00*

U.S. Cl. 219—121 L 28 Claims



1. A method of hardening the flank of a first gear tooth, the flank of a second gear tooth, and the root area between said first and second gear tooth, comprising:

supplying a high power laser light beam;

focusing said high power laser light beam at a predetermined focal length on the gear to establish a focused laser light beam;

scanning said focused laser light beam across the width of said gear to create a laser light bar;

rotating said gear about its axis to traverse said laser light bar down said flank of said first gear tooth, across said root area between said first and second tooth, and up said flank of said second tooth;

simultaneously moving said gear in a first direction to maintain as close as possible an approximation to perpendicularlity between said focused laser light beam and the surface of said gear on which said laser light bar is directed; and

simultaneously moving said gear in a second direction orthogonal to said first direction to maintain said predetermined focal length.

4,539,462

ROBOTIC LASER BEAM DELIVERY APPARATUS

Daniel J. Plankenhorn, Palo Alto, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 24, 1983, Ser. No. 460,346

Int. Cl.[3] G02B *7/18;* B23K *26/02*

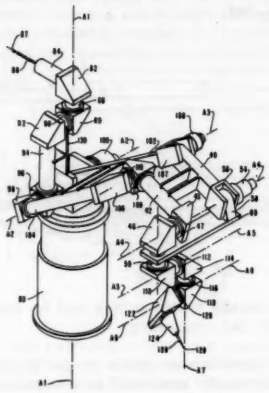
U.S. Cl. 219—121 LV 9 Claims

1. In combination with a robotic system having one or more mechanical joints defining at least in part a first axis of motion and a second axis of motion, which axes of motion define a contoured path through the robotic systems geometric range of motion, wherein each of said mechanical joints defines in part a frame member; an integral laser beam delivery system for the delivery of a beam along any point within said geometric range of motion comprising:

an optical joint having a housing with a reflective surface disposed therein mounted on the frame member of each

said mechanical joint so as to be in synchronous association with each said mechanical joint;

a tubular member disposed between adjacent optical joints and through which tubular member the beam passes as it travels from optical joint to optical joint, said tubular member being rigidly attached between the frame member of each mechanical joints with which said adjacent optical



joints are in synchronous association, wherein said reflective surface establishes a constant geometric relation between a segment of the beam impinging on said reflective surface and the axes of motion associated with said mechanical joints whereby the optical joints along with the tubular members dispose therebetween and each axis of motion are synchronous and incapable of mutual interference.

4,539,463

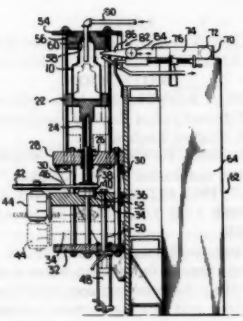
TRIMMING OF POLYESTER CONTAINERS USING A LASER

David P. Piccioli, Auburn; Ieuan L. Harry, Nashua, and Richard E. Clark, Merrimack, all of N.H., assignors to Continental Packaging Company, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 583,543, Feb. 24, 1984. This application Aug. 27, 1984, Ser. No. 644,471

Int. Cl.³ B23K *26/00*

U.S. Cl. 219—121 LG **12 Claims**



1. An apparatus for cutting off plastic containers from a combination container and adapter to provide an open mouth defined by a sealing edge, said apparatus comprising support means for supporting a combination container and adapter for rotation about a fixed axis, means for directing a laser beam generally towards said axis at a position along said axis to separate a container from an adjoining adapter with said laser beam being inclined to said axis towards the intended position of a container to form in such container a sealing surface, and absorber means positioned relative to said support for reception within and removal from a combination container and adapter to be cut for intercepting any laser beam passing through a combination container and adapter after cutting therethrough to prevent damage to such container remote from an area of cut off.

4,539,464

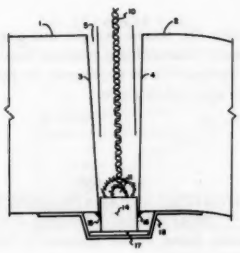
JOINING PARALLEL FACES OF THICK-WALLED STRUCTURES BY ARC WELDING

Allen W. Sindel, Biloxi, Miss., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 29, 1983, Ser. No. 526,941

Int. Cl.³ B23K *9/02*

U.S. Cl. 219—137 R **1 Claim**



1. An arc welding process for joining the walls of two bodies, including,

forming a vertical gap between the walls of the bodies to be joined,

positioning an elongated metallic structure along the length of the gap and up into the bottom of the gap,

tack welding the elongated metallic structure into place,

supporting and sealing the lower surface of the elongated structure with a support body positioned on the lower face of the elongated structure,

arc welding between the two walls forming the gap above the elongated structure and its support body until the gap is filled,

and gouging the elongated structure from the gap and completing the union between the two bodies by filling the gouged space of the gap with welding material.

4,539,465

WIRE FEED SYSTEM FOR ROBOT WELDER

Alexander A. Bosna, Arnold, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1983, Ser. No. 567,455

Int. Cl.³ B23K *9/12*

U.S. Cl. 219—137.7 **6 Claims**

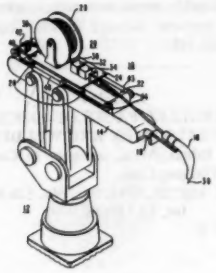
1. A wire storage and feed system for a metal inert gas welding system in which a welding gun is disposed at the extending end of a maneuverable robot arm, which wire storage and feed system comprises:

(a) wire storage and feed drive means disposed on a mounting plate which is movably mounted on the robot arm and movable in the direction of robot arm extension;

(b) wire conduit means connecting the welding gun and the wire storage and feed drive means;

(c) constant force spring means connecting the wire storage and fed drive means mounting plate to the robot arm, and counterweight means connected to the wire storage and feed drive means mounting plate; and

(d) pulley means spaced apart along the robot arm with connector means extending from opposed ends of the counterweight means to the wire storage and feed drive means mounting plate over respective spaced apart pulley



means, with the counterweight and the constant force spring means maintaining a constant tension on the welding gun irrespective of movement or positioning of the robot arm and welding gun.

4,539,466

ELECTRIC HEATING APPARATUS FOR DISSIPATING FOG FROM A WINDOW

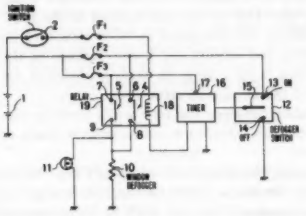
Yukio Yamamoto, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 25, 1984, Ser. No. 573,623

Claims priority, application Japan, Jan. 28, 1983, 58-11377

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—203 **11 Claims**



1. An electric heating apparatus for dissipating fog from a window, said apparatus comprising:

a power source;

at least one electromagnetic relay actuated by electric current through a first fuse from said power source;

an electric timer actuated by electric current through a second fuse from said power source, said timer being arranged in circuit with said relay to actuate said relay;

a switching means for actuating said timer, said timer being actuated by electric current supplied thereto by said switching means through a third fuse from said source;

a first contact means provided in said relay and connected with said power source at its input terminal through one of said first, second and third fuses;

a second contact means provided in said relay and connected with said power source at its input terminal through another one of said first, second and third fuses; and

an electric heating unit associated with said window and connected with the output terminals of said first and second contact means.

4,539,467

ELECTRICALLY HEATED CUTTING TOOL

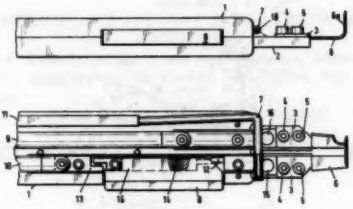
Helmut Wenger, Kraazberg, Fed. Rep. of Germany, assignor to Zangl GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,276

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1982, 3215503

Int. Cl.³ H05B *3/02*; B29C *17/10*; B26D *7/10*

U.S. Cl. 219—233 **10 Claims**



1. An electrically heated cutting tool for cutting rubber, plastic and the like, comprising:

a housing;

first and second contact pieces on the housing, each for being electrically connected to a respective pole of a power supply;

a blade of flat material for cutting through a substance in a cutting direction, the blade being substantially U-shaped and having first and second limbs and a connecting region therebetween connecting the first and second limbs; each of the first and second limbs having a respective free end disposed away from the connecting region for being connected to a respective one of the first and second contact pieces for permitting current to flow through the blade from the contact pieces; the limbs of the blade having a bent region between the free ends and the connecting region and being bent at right angles to the plane of the flat material in the bent region; the first limb of the blade being disposed in the cutting direction from the second limb and having a reduced width in and immediately adjacent to the bent region; and

first and second clamping plates, each clamping the free end of a respective one of the first and second limbs of the blade to the respective one of the first and second contact pieces.

4,539,468

WATER BOILING VESSEL IMMERSION HEATER WITH PRIMARY AND SECONDARY THERMAL CUT-OUT PROTECTION

Richard A. Phillips; Keith Fletcher, both of Buxton, and Peter W. Naylor, Tideswell, all of England, assignors to Otter Controls Limited, Buxton, England

Filed Mar. 16, 1983, Ser. No. 475,825

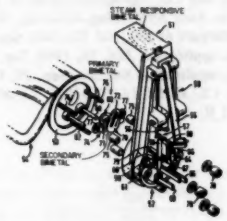
Claims priority, application United Kingdom, Mar. 18, 1982, 8207908; Sep. 27, 1982, 8227498; Feb. 4, 1983, 8303075

Int. Cl.³ H05B *1/02, 3/82*; H01H *37/54*; A47J *27/62*

U.S. Cl. 219—330 **33 Claims**

1. In combination with a water boiling vessel, an electrically powered heating element for heating water contained in said vessel up to boiling temperature, and an element protection unit for protecting said heating element against being overheated by virtue of power being supplied to the element when said element is not immersed in water, said heating element comprising a resistance heating portion and an element head portion, said element head portion serving for mounting said element in said vessel, and said element protection unit being mounted adjacent said element head portion so as to be subjected to being heated by heat developed in said head portion when said element is powered, said element protection unit

comprising first and second safety cut-out switches coupled electrically in series with one another and with said resistance heating portion of said element between power supply terminals of said element protection unit and respectively providing primary and secondary protection for said element, each of said first and second cut-out switches comprising a bimetallic element maintained in close thermally coupled relationship with said element head portion and providing thermally-responsive contacts-opening and contacts-closing movements via an electrically insulating coupling to a respective one of a first and a second pair of switching contacts each comprising a



fixed contact and a movable contact, and manually releasable latching means associated with the movable contact of at least said second cut-out switch for latching the same in its contacts-open condition until reset, the operating temperature of the bimetallic element of said first switch being set to determine a mean maximum operating temperature of said heating element and the operating temperature of the bimetallic element of said second switch being set above that of said first bimetallic element such that said second switch opens in the event that the heating element temperature increases substantially above said maximum operating temperature in consequence of failure of said first switch to operate.

4,539,469

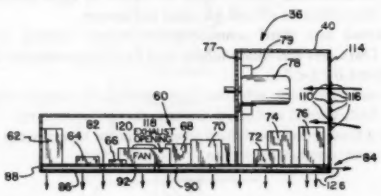
OVEN CONTROL CIRCUITRY COOLING SYSTEM FOR A DOUBLE-STACK FOOD PREPARATION OVEN ARRANGEMENT

Richard W. Gigandet, Fort Wayne, Ind., assignor to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Apr. 16, 1984, Ser. No. 600,837

Int. Cl.³ H05B *1/00;* **F24C** *15/32;* **H05K** *7/20*

U.S. Cl. 219—412 **23 Claims**



1. In a food preparation apparatus comprising:

an integral stackable oven including a cooking chamber, a conveyor assembly and oven control circuitry said conveyor assembly extending through an opening in a wall said oven;

a cooling system for insulating and cooling said oven control circuitry from a source of radiant heat and including;

a double wall assembly having a mounting wall including first and second sides;

oven control circuitry mounted on said first side and an exterior wall spaced apart from said second side of said mounting wall, said mounting wall and said exterior wall forming therebetween a compartment having an inlet for receiving a flow of cooling air and an outlet in said exterior wall for exhausting the flow of air; and

air moving means for forcibly moving said flow of air into said inlet, through said compartment and out of said outlet for forming an air curtain adjacent said oven, whereby said oven control circuitry is substantially insulated from said source of radiant heat by the flow of air between said mounting wall and said exterior wall and by said air curtain.

4,539,470

COUNTER APPARATUS FOR COUNTING FLAT PRODUCTS MOVED ALONG A CONVEYING PATH OR THE LIKE

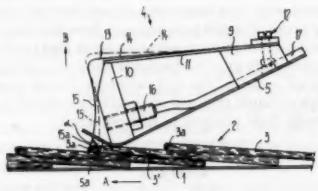
Werner Honegger, Tann-Rüti, and Hanspeter Bürgi, Salmsach, both of Switzerland, assignors to Ferag AG, Hinwil, Switzerland

Filed Oct. 29, 1982, Ser. No. 437,516

Claims priority, application Switzerland, Nov. 10, 1981, 7203/81

Int. Cl.³ G06M *7/06*

U.S. Cl. 235—98 B **8 Claims**



1. A counter apparatus for counting substantially flat products, especially printed products, which are moved along a conveying path in a predetermined product conveying direction, comprising:

a single elastically deflectable feeler having a free end;

said free end, in a rest position of said single elastically deflectable feeler, protruding into said conveying path of said substantially flat products;

said single elastically deflectable feeler protruding past a top surface of an oncoming substantially flat product and being elastically deflectable in and displaced substantial transversely to said predetermined product conveying direction by the entrainment of said free end of said single elastically deflectable feeler by a leading edge of each one of said substantially flat products without the need to deform said products in their conveying path;

said free end, in deflected positions of said single elastically deflectable feeler, forming an angle smaller than 90° with said top surface of said substantially flat product entraining said free end; and

an electrical signal transmitter responsive to movement of said single elastically deflectable feeler.

4,539,471

HYDRAULIC COUNTING CELL

Iosif Baumberg, 54 Bay 29 St., Brooklyn, N.Y. 11214

Filed Apr. 30, 1984, Ser. No. 605,131

Int. Cl.³ G06D *1/08*

U.S. Cl. 235—201 PF **6 Claims**

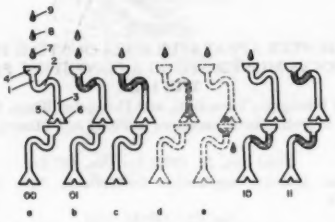
1. A hydraulic counting cell, comprising

an inlet portion arranged for receiving a plurality of drops of a liquid sucessively after one another and having a substantially vertical portion and a lower end;

an inclined portion having upper and lower ends and forming a short leg of a siphon, said lower end of said inlet portion being connected with said lower end of said inclined portion at a predetermined height so that the drops

of liquid pass into said inclined portion from said inlet portion;

a further portion having a substantially vertical axis and upper end lower ends forming a long leg of the siphon, said upper end of said further portion being connected with said upper end of said inclined portion at a height exceeding the first-mentioned height so that the drops of liquid pass into said further portion from said inclined portion; and



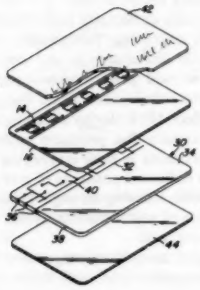
a flow dividing portion including two pipes with upper ends connected with said lower end of said further portion so that the drops of liquid pass into said flow dividing portion from said further portion, said two pipes also (and) having open lower ends so as to discharge the drops of liquid and to form an outlet of the cell, whereby during passage of the drops of liquid they are successively counted in accordance with their position in said portions.

4,539,472

DATA PROCESSING CARD SYSTEM AND METHOD OF FORMING SAME

John J. Poetker, Ellicott City, and Peter Poetker, Columbia, both of Md., assignors to Horizon Technology, Inc., Columbia, Md.

Filed Jan. 6, 1984, Ser. No. 567,743
Int. Cl.³ G06K *19/02*
U.S. Cl. 235—488 **60 Claims**



1. A data processing card system, comprising:

(a) means for mounting at least one circuit chip device, said circuit chip mounting means including first flexible carrier means comprising an electrically insulating tape layer member having at least one aperture formed therethrough for registry with predetermined electrically active areas of said chip device and a plurality of electrically conductive lead members secured to said insulating tape member and extending within said aperture for coupling to said active areas of said chip device;

(b) substrate carrier means formed of a substantially rigid, electrically insulated and thermally conductive member composition located adjacent said circuit chip device mounting means, said substrate carrier means having at least a first predetermined electrical lead pattern formed thereon, said first electrical lead pattern being electrically coupled to predetermined contact areas of said circuit chip device; and,

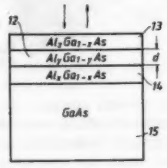
(c) means for substantially isolating said combined substrate carrier means and said circuit chip device mounting means from an external environment.

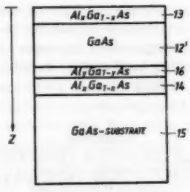
4,539,473

OPTICALLY EXCITABLE LUMINESCENT SENSOR ELEMENTS

Torgny Brogardh, and Christer Ovren, both of Västerås, Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

Continuation-in-part of Ser. No. 306,349, Sep. 28, 1981, abandoned. This application Jun. 28, 1984, Ser. No. 625,619
Claims priority, application Sweden, Sep. 29, 1980, 8006797
Int. Cl.³ G01K *11/20;* **H01L** *33/00*
U.S. Cl. 250—211 R **23 Claims**





20. A sensor element adaptable for measurement of a physical parameter and formed of a crystalline material, comprising:

a first semiconductor layer composed of GaAs for emitting luminescence spectra upon excitation by light spectra and the influence of said physical parameter;

second and third semiconductor layers formed of Al_x-$Ga_{1-x}As$ and sandwiching said first semiconductor layer; where $0<x<0.6$;

a semiconductor substrate formed of GaAs supporting said first, second and third semiconductor layers; and

said first, second and third semiconductor layers being of the same conductivity type.

4,539,474

OPTICAL SWITCH FOR AN AUTOMATIC DOOR

Yoshiro Takahata, Machida, Japan, assignor to Hondadenshigiken Co., Ltd., Japan

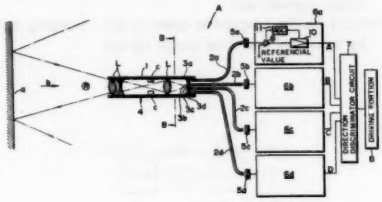
Filed Jun. 21, 1982, Ser. No. 390,330
Int. Cl.³ G01V *9/04*
U.S. Cl. 250—221 **8 Claims**

1. A passive optical switch for an automatic door for automatically opening and closing a door, by sensing the direction of movement of passing bodies within a sensing area, comprising:

light receiving means having at least two groups of optical fiber cables, each group having first and second ends, the first ends forming light receiving surfaces, wherein each

surface is positioned to receive light from a different portion of a sensing area;

phototube cell converter means, conncected to the second ends of the optical fiber cables, for producing a separate indication signal, for each light receiving surface, which has a characteristic indicative of the intensity of light received by that light receiving surface; and



direction discriminator circuit means for receiving said separate indication signals and for producing a control signal for driving an automatic door in response to a passing body being sensed in one sensing area portion after being sensed in another sensing area portion, as indicated by the characteristics of said separate indication signals.

4,539,475

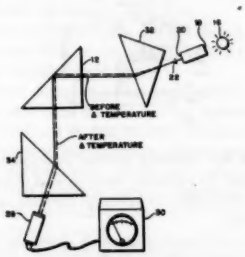
TEMPERATURE COMPENSATION SYSTEM FOR A PRISM IN AN OPTICAL TRANSDUCER

Thomas W. Bosse, New Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 14, 1983, Ser. No. 474,778

Int. Cl.³ G01L *1/24*

U.S. Cl. 250—231 P **7 Claims**



1. An optical transducer comprising:

a first prism, means for directing light to said first prism, a second prism intermediate said first prism and said light directing means, said second prism being oriented to receive light from said light directing means and transmit the light toward the hypotenuse of said first prism, means for measuring the intensity of light internally reflected from the hypotenuse of said first prism and a third prism intermediate said first prism and said light intensity measuring means, said third prism being oriented to receive light reflected from the hypotenuse of said first prism and transmit the light to said light intensity measuring means.

4,539,476

MODULE FOR A FIBER OPTIC LINK

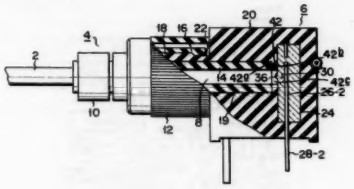
Kenichi Donuma, Koshigaya; Makoto Ohashi, Kawasaki, and Takeshi Ozeki, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 325,485, Nov. 27, 1981,. This application May 14, 1984, Ser. No. 610,171

Claims priority, application Japan, Nov. 28, 1980, 55-166684; Nov. 28, 1980, 55-166685; Nov. 28, 1980, 55-166688

Int. Cl.³ G02B *5/14*

U.S. Cl. 250—227 **12 Claims**



1. A module for a fiber optical link of the type mateable with a fiber optic plug connector which terminates at a plug end face, said module comprising:

a body case molded from a light-shielding material and defining an elongated plug hole for receiving the plug connector which is mateable with the module by axial insertion of the plug connector into the plug hole, said body case also defining a hollow space in communication with the plug hole;

a molded member having a front face, said molded member being seated in the hollow space of the body case and being molded from a transparent molding material;

a lens element integrally formed with said molded member at a position in coaxial alignment with said plug hole;

leads embedded in said molded member and extending exteriorly of said body case;

an optoelectronic element mounted on one of the leads embedded in the molded member in a coaxially aligned position with said lens element and said plug hole; and

protection means, integral with said molded member, for protecting said lens element by preventing contact between said lens element and said plug end face when the plug connector is mated with said plug hole, said portection means including space-defining means for defining a space which is recessed into said molded member rearwardly of said flat face and coaxially disposed relative to said plug hole, said lens element being extended forwardly into said space towards said plug hole, said space-defining means establishing, at said flat face, a contact surface peripherally of said recessed surface against which said plug end face bears when said plug connector is mated with said plug hole whereby contact between said plug end face and said lens element is prevented.

4,539,477

METHOD AND APPARATUS FOR SUPPRESSING DISTURBANCES IN THE MEASUREMENT OF SIGNALS WITH A PARTICLE PROBE

Hans-Peter Feuerbaum, and Reinhold Schmitt, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 31, 1983, Ser. No. 499,484

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 3235484

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—310 **15 Claims**

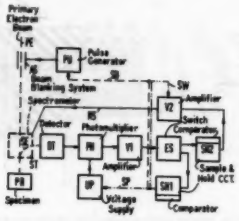
1. A method of suppressing a disturbance in measuring signals with a particle probe in which a primary electron beam is directed onto test points of a speciman and the secondary

electrons emitted from the specimen are detected and measured as representing signals at those test points, comprising the steps of:

applying a known reference voltage to a reference test point on a specimen to produce a known test signal at the reference test point;

directing a primary electron beam, at least one time, during a reference phase, to the reference test point causing secondary electron emission;

generating a control field with a retarding field generator;



detecting the secondary electrons through the control field and generating a measured secondary electron signal; and

feeding back the measured secondary electron signal as a reference signal to the field generator to control the field intensity during measurement of unknown signals at other test points on the specimen during a measuring phase to compensate for operating point shifts due to electron beam fluctuations and specimen contamination and maintain a specific operating point.

4,539,478

METHOD AND APPARATUS FOR PICTURE SIGNAL ENHANCEMENT

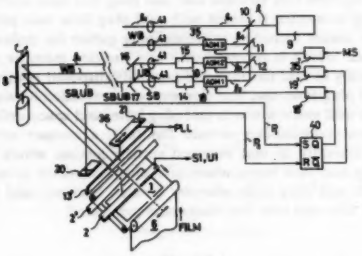
Tetsuo Sano, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd, Kyoto, Japan

Filed Jan. 24, 1983, Ser. No. 460,352

Claims priority, application Japan, Feb. 16, 1982, 57-23798

Int. Cl.³ H04N *1/04*

U.S. Cl. 250—235 **4 Claims**



4. An apparatus for photoelectrically scanning an original picture by means of plural scanning beams of light projected on at least one deflecting means and reflected therefrom so as to produce series of image signals adapted to control a recording scan beam for recording a duplicated picture on a photosensitive material, the apparatus comprising:

means for generating two scanning beams of different sizes of focused areas on the original picture, the beams being oscillated in a principal scanning direction;

means for generating a recording scan beam synchronized with one of said two scanning beams so as to expose the photosensitive material;

means for alternately switching over from one of the scanning beams to the other scanning beam to thereby alternately project each of said scanning beams to the deflecting means at an interval of half a scanning period of the original picture;

a photoelectrical converter adapted to detect said scanning beams projected on the picture for subsequent production of the series of image signals corresponding to said beams;

means for electronically processing the image signals produced by the converter so as to make a series of final image signals; and

control means adapted to control the recording scan beam by means of said final image signals.

4,539,479

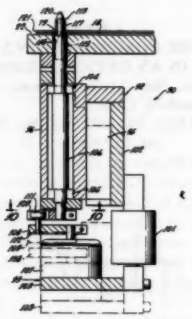
AUTOMATIC APPARATUS AND METHOD FOR EXPOSING, REGISTERING, AND HANDLING DOUBLE-SIDED PRINTED CIRCUIT BOARDS

Ronald E. Sheets, 10745 Quadrille Pl., Santa Ana, Calif. 92705; George A. Barbas, 32772 Shipside Dr., Dana Point, Calif. 92629; Howard W. Doering, Jr., 9682 Blanche Ave., Garden Grove, Calif. 92641, and John R. Bjorkman, 3021 Madeira Ave., Costa Mesa, Calif. 92626

Continuation-in-part of Ser. No. 470,571, Feb. 28, 1983, abandoned. This application Dec. 9, 1983, Ser. No. 559,745

Int. Cl.³ B65G *49/06*

U.S. Cl. 250—491.1 **12 Claims**



1. Apparatus for effecting precise positioning of a circuit board preparatory to exposure thereof, said circuit board having a plurality of nonparallel openings therethrough, said apparatus comprising:

(a) a plurality of board-positioning elements each having a portion adapted to be inserted into one of the nonparallel openings in a circuit board, and when thus inserted to be in loose non-binding relationship relative to the walls of such opening,

each such portion being noncircular in the plane of said circuit board,

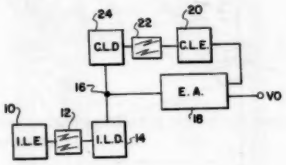
each such portion being so shaped and sufficiently large, in the plane of said circuit board, that when such portion is rotated it will engage the walls of such opening to thereby shift and position said circuit board in said plane, and

(b) means to effect rotation of said board-positioning elements and cause such portions to thus shift and position said board.

4,539,480
ELECTRICAL ISOLATION SYSTEM

Antonio T. Artinano; Hernan N. Jiménez; Bernal C. Thalman, and Marco A. E. Vásquez, all of San José , Costa Rica, assignors to Cibertec S.A., San José , Costa Rica

Filed Nov. 8, 1982, Ser. No. 439,916
Int. Cl.[3] G02B *27/00*
U.S. Cl. 250—551 11 Claims



1. A linear isolation circuit system for interconnecting two operationally interrelated subcircuits comprising

an input circuit including

first light-emitting means for producing a quantum of light proportional to the magnitude of an electrical signal to be transmitted,

first photo detector means responsive to the quantum of light produced by said first light-emitting means for generating a first selectively directed electrical current at a junction point of a magnitude proportional to said quantum of light emitted by said first light-emitting means, and

first light transmitting means for optically transmitting said quantum of light from said first light-emitting means to said first photo detector means;

an output circuit including

second light-emitting means for producing a quantum of light proportional to the magnitude of a control current flowing therethrough,

second photo detector means responsive to the quantum of light produced by said second light-emitting means for generating a second electric current of a magnitude proportional to said quantum of light produced by said second light-emitting means and selectively directed toward said junction point in opposition to said first selectively directed current generated by said first photo detector means,

second light transmitting means for optically transmitting said quantum of light from said second light-emitting means to said second photo detector means,

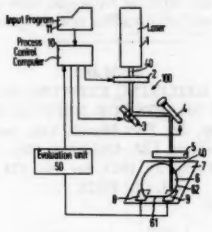
amplifier means responsive to the magnitude of said first current from said first photo detector at said junction point for producing said control current for said second light-emitting means in a magnitude to effect the emission of sufficient light therefrom to render the magnitude of said second current equal to that of said first current,

whereby the magnitude of said control current for said second light emitting means is proportional to the magnitude of said electrical signal and is electrically isolated therefrom.

4,539,481
METHOD FOR ADJUSTING A REFERENCE SIGNAL FOR A LASER DEVICE OPERATING IN A GIANT PULSE MODE

Theo Troukens, and Antoon Mattelin, both of Oostkamp, Belgium, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 21, 1982, Ser. No. 435,690
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1981, 3147355
Int. Cl.[3] G06K *15/00*
U.S. Cl. 250—557 8 Claims

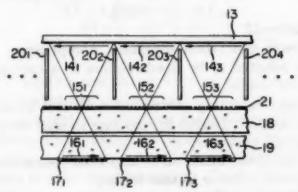


3. In a device for adjusting the reference system of a preprogammable beam deflection system of a laser processing device with respect to the position of an inscription field of a part to be processed, said device for adjusting including means for conducting a plurality of programmed search motions of a laser beam from a laser operating in a continuous wave mode, photoelectric elements positioned to detect light signals during each search motion, means for calculating the precise position of the part with respect to the reference system from the detected light signals and means for correcting the coordinates of the reference system in response to the precise position, the improvements comprising the means for conducting a plurality of program search motions having each search motion traveling in a path that traverses an edge of the part being processed and each of the photoelectric elements being disposed below the part and in a path to receive the scanning light as the scanning motion passes over the edge of the part to trigger a corresponding position signal.

4,539,482
READING APPARATUS

Noriyuki Nose, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1981, Ser. No. 309,380
Claims priority, application Japan, Oct. 9, 1980, 55-141188; Nov. 17, 1980, 55-161547; May 29, 1981, 56-82682; Jun. 19, 1981, 56-94646; Jun. 23, 1981, 56-97769; Jun. 23, 1981, 56-97770; Aug. 7, 1981, 56-124542; Sep. 18, 1981, 56-148613; Sep. 30, 1981, 56-155223
Int. Cl.[3] H01J *40/14*
U.S. Cl. 250—578 12 Claims



1. An apparatus for reading an original surface, comprising:

supporting means for supporting the original surface;

a plurality of unit reading optical systems each for reading a respective part area of the original surface, each of said unit reading optical systems having a zone plate and a photosensor means provided at a position whereat diffracted light of at least one predetermined order from the corresponding one of said zone plates is condensed and focused to form an image of the corresponding part area of the original surface, said unit reading optical systems being arranged in a predetermined array to read the entire area of the original surface; and

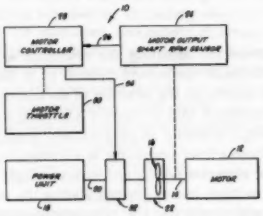
light intercepting means disposed between said zone plate and said photosensor means of each said unit reading optical system to block entry into said photosensor means of a light beam directed from said zone plate of an adjacent one of said unit reading optical systems.

4,539,483

SYSTEM FOR UTILIZING EXISTING MOTORS WITH OUTPUT SHAFTS FOR DRIVING BLADES

Charles C. Freeny, Jr., Fort Worth, Tex., assignor to Power Technology Partners, Ltd., Oklahoma City, Okla.

Filed Aug. 31, 1983, Ser. No. 528,141
Int. Cl.³ H02K 7/18
U.S. Cl. 290—1 R **14 Claims**



1. A system for utilizing existing motors with output shafts for drivingly rotating blades, comprising:

a connector having one portion removably connectable to the output shaft of the motor comprising:

a base having a connecting surface and a blade depression being formed in the connecting surface, the blade depression being shaped and adapted to receive the blades on the output shaft of the motor and the disposition of the blades in the blade depression providing the removable connection between the motor and connector; and

a power unit adapted for delivering power having an input shaft, the connector having a portion connectable to the power unit, the motor providing power input to the power unit through the connector, thereby driving the power unit.

4,539,484

WAVE AND TIDE POWERED GENERATION APPARATUS

Louis F. Suggs, Rte. 3, Antlers, Okla. 74523

Filed Jun. 6, 1980, Ser. No. 157,017
Int. Cl.³ F03B 13/12
U.S. Cl. 290—53 **25 Claims**

1. A power generation apparatus, comprising:

a frame adapted to be fixed relative to a varying level of a body of water;

float means operably associated with said frame for movement relative thereto in response to said varying level of said body of water;

a rotatable drum attached to said float means for movement therewith relative to said frame;

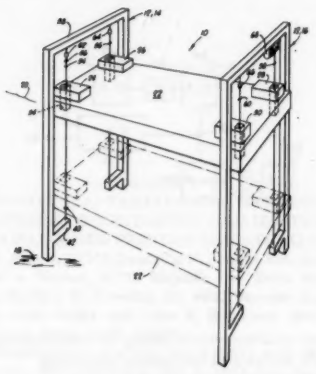
drive line means, having upper and lower ends attached to upper and lower parts of said frame, respectively, and having a middle portion wrapped around said rotatable drum, for rotating said drum in a first direction when said float means rises relative to said frame and for rotating said drum in a second direction opposite said first direction when said float means descends relative to said frame; and

power transfer means for transmitting the rotary motion of said drum to a device to be driven thereby, said power transfer means including:

a power shaft;

first and second gear assemblies, operably associated with said power shaft;

a first clutch means including a first ratchet, operably associated with a first end of said drum, for immediately



driving said power shaft through said first gear assembly when said drum begins rotating in said first direction, and for allowing said first gear assembly to immediately freely rotate relative to said drum when said drum begins rotating in said second direction; and

a second clutch means including a second ratchet, operably associated with a second end of said drum, for immediately driving said power shaft through said second gear assembly when said drum begins rotating in said second direction, and for allowing said second gear assembly to immediately freely rotate relative to said drum when said drum begins rotating in said first direction.

4,539,485

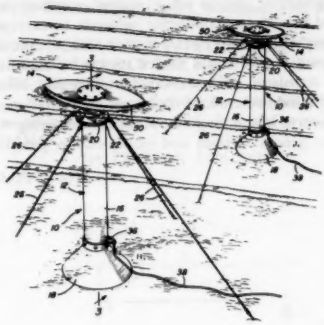
WAVE ACTIVATED GENERATOR

Victor L. Neuenschwander, Box 1098, Bloomfield, N. Mex. 87413

Filed Oct. 7, 1983, Ser. No. 540,602
Int. Cl.³ F03B 13/12
U.S. Cl. 290—53 **12 Claims**

1. An electrical generator structure adapted to be mounted in the sea for actuation by wave motion comprising an elongate static tube assembly, means for anchoring the tube assembly in vertically extending relation on a seabed, an electrical induction coil extending lengthwise within the tube assembly, means for providing connection of the respective ends of the coil with electrical apparatus external to the tube assembly, a rod vertically reciprocably received within the tube assembly, the rod having an upper end portion projecting from an upper end of the tube assembly, at least one magnet on the rod internally of the coil, and a float on the upper end portion of the rod adapted to be located at the water surface so as to rise and fall responsive to wave motion thereby providing vertical reciprocation of the magnet effective to induce an electrical current in the

coil, wherein the float is of elongate navicular hull-shaped form, having a lenticular-shaped upper surface and a hull-



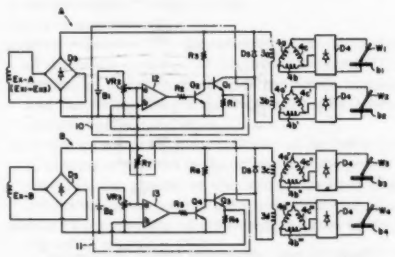
shaped lower surface and the rod is freely rotatably mounted in the tube structure.

4,539,486

SINGLE-CORE INDUCTOR GENERATOR FOR WELDING PRODUCING MULTIPLE, MUTUALLY-INDEPENDENT OUTPUTS

Yoshikazu Saito, Tokyo, and Hiroshi Nakaya, Kawagoe, both of Japan, assignors to Denyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,147
Claims priority, application Japan, Feb. 8, 1983, 58-19037
Int. Cl.³ B23K *9/10*
U.S. Cl. 307—34 **2 Claims**



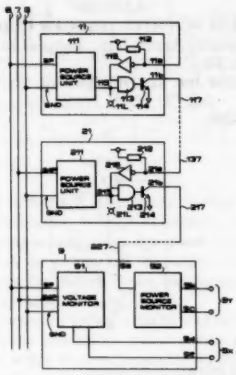
1. In a single core inductor generator for welding which has a stator core divided into a plurality of field pole pairs respectively having field windings and excitation windings and is adapted to derive mutually independent outputs from armature windings wound respectively in said field pole pairs, the improvement wherein constant-current control circuits for detecting the current values of the fields and carrying out control to maintain said detected values at adjustably variable set values are respectively interposed between said field and excitation windings, each of said constant-current control circuits being provided with a respective comparator circuit which compares a value of the output signal of a respective constant-current control circuit with a respective set value, the constant-current control circuits being connected through a resistance element which is coupled to input terminals set valves are respectively applied so that, when the field current of one of said constant current control circuits to which said, field winding undergoes a variation, the field current of each of the other field windings is compensated and controlled to vary from the set value thereof by an increment corresponding to the magnitude of said variation of the field current of said one field winding.

4,539,487

POWER SUPPLY SYSTEM

Tetsuo Ishii, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1983, Ser. No. 528,422
Claims priority, application Japan, Nov. 26, 1982, 57-208215
Int. Cl.³ H02J *1/10*
U.S. Cl. 307—44 **3 Claims**



1. A power system comprising a plurality of power units connected to a common bus for supplying power to a load and having a total capacity larger than a maximum power consumption of said load by at least the amount of one of said power units, each of said power units having a capacity smaller than said maximum power consumption of said load and comprises a power source means which provides a specified voltage output to said bus and issues a normality signal when said power unit operates normally; and

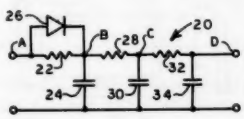
a power monitoring circuit comprising a voltage monitoring circuit which checks up the voltage on said bus and issues a first normal signal when the voltage is normal, and a power unit monitoring circuit which detects that all of said power source means are operating and provides a second normal signal.

4,539,488

PULSE WAVE TO PARABOLA WAVE CONVERTER

Stanley E. Lehnert, Addison, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 325,783, Nov. 30, 1981,. This application Feb. 1, 1984, Ser. No. 576,077
Int. Cl.³ H03K *5/01, 5/145*
U.S. Cl. 307—261 **3 Claims**



1. A low insertion loss circuit for converting a pulse signal to a parabolic waveform, comprising:

an input terminal for receiving the pulse signal;

a first integrating resistance-capacitance network having a first input and output terminal said first input terminal coupled to said input terminal;

a second integrating resistance-capacitance network having a second input and output terminal, said second input terminal coupled in series with said first output terminal;

a third resistance-capacitance network having a third input

and output terminal, said third input terminal coupled in series with said second output terminal for developing said parabolic waveform; and

a diode coupled between said input terminal and said first output terminal assuming conductive and non-conductive states in response to opposite polarities of the pulse signal so as to alternately configure the circuit as a two-stage and a three-stage integrator, respectively.

4,539,489

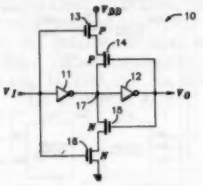
CMOS SCHMITT TRIGGER CIRCUIT

Herchel A. Vaughn, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 22, 1983, Ser. No. 506,745

Int. Cl.³ H03K *3/356, 3/295*

U.S. Cl. 307—290 **3 Claims**



1. A Schmitt trigger comprising:

a first inverter having an input for receiving an input signal, and an output coupled to a control node;

a second inverter having an input coupled to the control node, and an output for providing an output signal; and

a pair of series coupled transistors of a first conductivity type coupled between a first power supply terminal and the control node, with one of the pair having a control electrode for receiving the input signal and the other of the pair having a control electrode for receiving the output signal.

4,539,490

CHARGE PUMP SUBSTRATE BIAS WITH ANTIPARASITIC GUARD RING

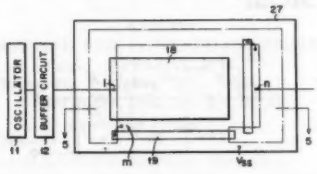
Shoji Arizumi, Tokyo, and Makoto Segawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 212,544, Dec. 3, 1980,. This application May 13, 1985, Ser. No. 494,266

Claims priority, application Japan, Dec. 8, 1979, 54-159487; Dec. 8, 1979, 54-159488

Int. Cl.³ H01L *27/04;* **G11C** *11/40*

U.S. Cl. 307—296 R **3 Claims**



1. A self-substrate bias circuit semiconductor device comprising:

a semiconductor substrate of a first conductivity type;

an oscillator fabricated on said semiconductor substrate for generating pulse signals;

a rectify-charge pump circuit section fabricated on said semiconductor substrate and including a coupling capacitor connected to said oscillator to be supplied with pulse signals, a first field effect transistor connected between said capacitor and a reference voltage source, and a second field effect transistor connected between said capacitor of said substrate and said substrate; and

a semiconductor region of a second conductivity type formed in said semiconductor substrate to surround said rectify-charge pump circuit section and to function as a capacitive region and a source region for said first field effect transistor, said semiconductor region being connected to said reference voltage source for functioning as a capacitive guard ring that absorbs fluctuating minority carriers generated from said rectify-charge pump circuit.

4,539,491

VOLTAGE/CURRENT CONVERSION CIRCUIT

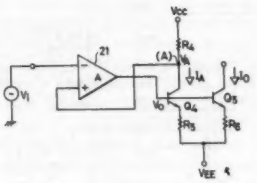
Akira Nishioka; Yoshihiro Kawanabe; Hiroyuki Takahori, and Hideki Fujimoto, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 16, 1982, Ser. No. 399,048

Claims priority, application Japan, Jul. 20, 1981, 56-114129

Int. Cl.³ H03K *3/01;* **H03F** *3/68*

U.S. Cl. 307—297 **3 Claims**



1. A voltage/current conversion circuit comprising:

an operational amplifier having first and second input terminals;

a first NPN transistor having an emitter connected through a first emitter resistor to a first power supply, a base connected to an output terminal of said operational amplifier, and a collector connected through a resistor to a second power supply;

a second NPN transistor having an emitter connected through a second emitter resistor, to said first power supply, a base commonly connected to the base of said first transistor, and a collector, the ends of said first and second emitter resistors away from said transistors being connected together;

a negative feed-back loop for feeding back a collector output of said first transistor to the first input of said operational amplifier;

means for applying a predetermined input voltage to the second input terminal of said operational amplifier;

a lead connected to the collector of said second transistor for deriving an output current therefrom; and

wherein said output current is proportional to said input voltage.

4,539,492

DARLINGTON TRANSISTOR CIRCUIT

Hartmut Michel, Reutlingen; Lothar Gademann, Rottenburg, and Erich Jesse, Marbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

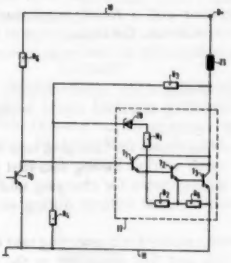
PCT No. PCT/DE82/00045, § 371 Date Jan. 27, 1983, § 102(e) Date Jan. 27, 1983, PCT Pub. No. WO82/04509, PCT Pub. Date Dec. 23, 1982

PCT Filed Mar. 5, 1982, Ser. No. 464,503

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1981, 3123667

Int. Cl.³ H03K *3/26, 3/313*

U.S. Cl. 307—315 7 Claims



1. Darlington transistor circuit for switching of an inductive load (ZS) having

a current supply voltage source;

a power transistor (T_3);

a driver transistor (T_2), the collector of the power transistor (T_3) and the collector of the driver transistor (T_2) being connected together, the base of the power transistor (T_3) and the emitter of the driver transistor (T_2) being connected together;

an initial transistor (T_1), the collector of the initial transistor (T_1) being connected to the collector of the power transistor (T_3), the emitter of the initial transistor (T_2) being connected to the base of the driver transistor (T_2);

means (T_0) providing an input trigger signal to the base of the initial transistor (T_1),

said Darlington transistor circuit comprising

a series circuit including a voltage divider comprising

a first resistor (R_1) and a second resistor (R_2) forming the voltage divider, and having a tap or junction point between the first and second resistor, the tap or junction point being connected to the base of the driver transistor (T_2),

said series circuit further including a Zener diode (ZD),

the terminal of the first resistor (R_1) remote from the tap or junction point being connected to the anode of the Zener diode (ZD), the cathode of the Zener diode being connected to a terminal (B+) of the current supply voltage source through the inductive load,

the terminal of the second resistor (R_2) remote from the tap or junction point being connected to the emitter of the driver transistor (T_2),

so that the second resistor (R_2) will be connected in parallel across the base-emitter path of the driver transistor,

and wherein the ratio of resistances of the first (R_1) and the second (R_2) resistors is selected in accordance with a selected temperature/turn-ON voltage relationship at the cathode of the Zener diode (ZD).

4,539,493

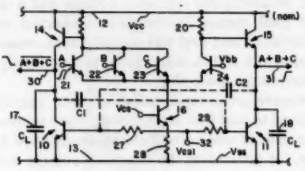
DYNAMIC ECL CIRCUIT ADAPTED TO DRIVE LOADS HAVING SIGNIFICANT CAPACITANCE

Hemmige D. Varadarajan, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 9, 1983, Ser. No. 550,528

Int. Cl.³ H03K *19/013, 19/086*

U.S. Cl. 307—455 20 Claims



1. In an ECL OR/NOR gate circuit having multiple input transistors, a reference voltage transistor, complementary output lines having inverting and non-inverting characteristics, emitter followers for pulling up the output lines and current source transistors for pulling down the output lines, the improvement comprising:

a capacitor connected between the base of at least one of said current source transistors and a circuit point having a logic level which is complementary to the logic level of said output line pulled down by said current source transistor for providing a transient increase of potential on said base of said current source transistor when said circuit point goes from a low to a high logic level.

4,539,494

SEMICONDUCTOR DEVICE FOR USE IN A SENSE AMPLIFIER

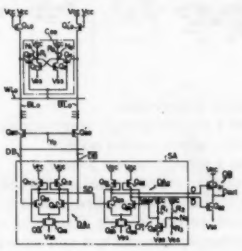
Setsuo Kurafuji, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 25, 1983, Ser. No. 478,725

Claims priority, application Japan, Mar. 30, 1982, 57-50089

Int. Cl.³ H03K *5/24;* G01R *19/165;* G11C *7/06*

U.S. Cl. 307—530 9 Claims



1. A semiconductor device for amplifying a difference in potential between a storage state of a memory cell and a reference voltage, comprising:

first power supply means for providing a first potential;

second power supply means for providing a second potential, lower than said first potential;

first amplifying means, operatively connected to the memory cell, for sensing the storage state of the memory cell and for generating a data signal with a temperature dependency;

second amplifying means for producing an output signal in dependence upon the data signal and the reference voltage, comprising:

first and second load means, operatively connected to said first power supply means, for providing loads;

a first enhancement-type MIS transistor having a drain operatively connected to said first load means, a gate operatively connected to said first amplifying means to receive the data signal and a source;

a second enhancement-type MIS transistor having a drain operatively connected to said second load means, a gate for receiving the reference voltage and a source; and

third load means, operatively connected between the sources of said first and second enhancement-type MIS transistors and to said second power supply means, for providing a load; and

a temperature-compensating circuit, operatively connected to said first and second power supply means and the gate of said second enhancement-type MIS transistor, for generating the reference voltage and providing temperature compensation by changing the reference voltage in accordance with changes in temperature to provide the reference voltage with a temperature dependency which is different from the temperature dependency of the data signal; and

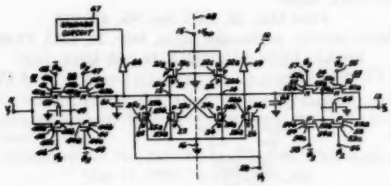
output buffer means, operatively connected to said first and second load means, for buffering the output signal to produce a buffered output signal having a level, said temperature compensating circuit compensating for changes in the level of the buffered output signal caused by the changes in temperature.

4,539,495

VOLTAGE COMPARATOR

Michael J. Demler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 24, 1984, Ser. No. 613,480
Int. Cl.³ H03K *5/24, 3/023*
U.S. Cl. 307—530 **8 Claims**



1. A voltage comparator:

a first and a second voltage supply terminal,

a first and a second output node,

a first and a second current source,

said first current source connected between said first voltage supply terminal and said first output node,

said second current source connected between said first voltage supply terminal and said second output node,

a first capacitor and a second capacitor of substantially identical capacitance,

said first capacitor connected between said first output node and said second voltage supply terminal,

said second capacitor connected between said second output node and said second voltage supply terminal,

a first and a second insulated-gate field-effect transistor of one channel conductivity type and of substantially identical structure,

the channel of said first insulated-gate field-effect transistor connected between said first output node and said second voltage supply terminal,

the channel of said second insulated-gate field-effect transistor connected between said second output node and said second voltage supply terminal,

the gate of said first insulated-gate field-effect transistor connected to said second output node,

the gate of said second insulated-gate field-effect transistor connected to said first output node,

means for applying a first unidirectional voltage between said first and second voltage supply terminals,

a first switching means for connecting said first output node to said second voltage supply terminal during a first period of time whereby the potential of said first output node is set to substantially the potential of said second voltage supply terminal during said first period of time,

a second switching means for connecting said second output node to said second voltage supply terminal during said first period of time whereby the potential of said second output node is set to substantially the potential of said second voltage supply terminal during said first period of time,

a third capacitor and a fourth capacitor of substantially identical capacitance, the capacitance of said third capacitor being comparable to the capacitance of said first capacitor,

means for providing a first signal voltage,

means for providing a second signal voltage less than said first signal voltage,

a third switching means for charging said third capacitor to said first signal voltage during said first period of time,

a fourth switching means for charging said fourth capacitor to said second signal voltage during said first period of time,

a fifth switching means for connecting said third capacitor in parallel with said first capacitor at the end of said first period of time,

a sixth switching means for connecting said fourth capacitor in parallel with said second capacitor at the end of said first period of time,

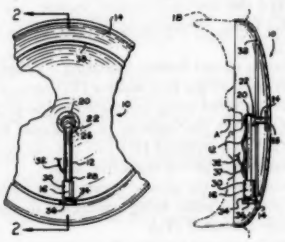
whereby at the end of said first period of time the first and second capacitors and hence the gates of said first and second transistors are charged through said first current source and said second current source causing said second transistor to become conductive as the gate thereof has a greater initial voltage appearing thereon than the gate of said first transistor and causing said first transistor to remain nonconductive as the voltage on said second output node is fed back to the gate of said first transistor.

4,539,496

EXTERNALLY MOUNTED GENERATORS FOR PNEUMATIC WHEELS

Stephen E. Thomas, 4015 Heron Pl., Fremont, Calif. 94536, and Mark S. Thomas, 3770 Flora Vista, Santa Clara, Calif. 95051

Filed Apr. 11, 1984, Ser. No. 599,144
Int. Cl.³ H02K *11/00;* **B60C** *23/04*
U.S. Cl. 310—68 B **9 Claims**



9. A generator assembly for a rotatable wheel having a first axis of rotation, said generator assembly comprising:

a support member;

free bearing means rotatably coupling said support member to said wheel, such that said wheel can rotate without

rotating said support member, said free bearing means permitting said support member to move in both a clockwise and a counterclockwise direction relative said wheel;

generating means attached to a portion of said support member distal from said first axis of rotation, said generating means being operative to develop electric power from the rotation of said wheel, said generating means including stator means attached to said support member, rotor means rotatably attached to said support member for rotation around a second axis which is substantially perpendicular to said first axis of rotation of said wheel, and a drive wheel coupled to a said rotor; and

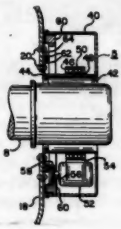
a driving surface coupled to said wheel for mutual rotation thereweith, said drive wheel being tangentially engaged with said driving surface such that rotation of said wheel around said first axis causes said drive wheel to rotate around said second axis.

4,539,497

ELECTRICAL GENERATOR WITH RING HOUSING MOUNTABLE ON A WHEEL ASSEMBLY

Robert E. Boyer, 2650 Davison St., River Grove, Ill. 60171

Filed Apr. 11, 1983, Ser. No. 483,710
Int. Cl.³ H02K *7/10*
U.S. Cl. 310—75 R **9 Claims**



1. A wheel mountable ring assembly for surrounding an axle of a wheel, comprising, in combination: a ring shaped housing having an outer side wall, front and rear face walls, and an interior passage wall forming an interior passage, said housing being mountable for rotation with the wheel and with said passage wall disposed around the axle in a spaced-apart relation, electromagnetic potential generating means, a drive shaft for said generating means, a driven gear means mounted on said drive shaft, a ring gear mounted in said housing, gear teeth on said ring gear engaging said driven gear means, bearing means rotatably journaled on said interior passage wall within said housing, said generating means mounted from said bearing means and suspended thereby as a pendulum to maintain a substantially non-rotating condition whereby rotation of said housing and said wheel causes said ring gear to drive said driven gear means and said drive shaft to actuate said generating means to develop electrical power.

4,539,498

SUPPORT SYSTEM FOR A SUBMERSIBLE D.C. MOTOR

Robert D. Wilkes, Little Rock, Ark., assignor to Jacuzzi Inc., Little Rock, Ark.

Filed Sep. 16, 1982, Ser. No. 418,789
Int. Cl.³ H02K *5/10*
U.S. Cl. 310—87 **11 Claims**

1. A submersible electric D.C. motor comprising:

a sealable housing including an end plate,

an electric D.C. motor mounted to said end plate within said housing having an extending rotatable shaft,

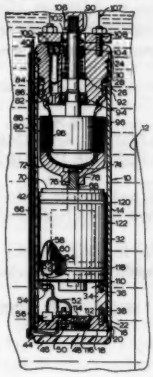
a second rotatable shaft,

an impermeable barrier between said first and second shafts,

means for transmitting mechanical energy from said first shaft to said second shaft across said barrier,

a well formed in said end plate interior of said housing,

a water retention member insertable in said well and being in communication with the atmosphere within said sealed housing, and



an active material which chemically binds oxygen insertable in said well with said water retention member and also being in communication with the atmosphere within said sealed housing;

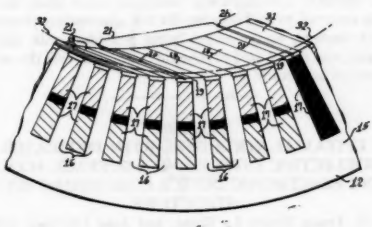
whereby said atmosphere within said housing is converted from ambient air to an atmosphere which has free water vapor and low oxygen content after said housing is sealed.

4,539,499

DEVICE FOR DETECTION OF CONTACT BETWEEN ROTOR AND STATOR

William E. Punch, 2951 Lenox Ave., Jacksonville, Fla. 32205, and Robert E. Weekley, 543 N. Jackson, Medford, Wis. 54451

Filed Jan. 3, 1984, Ser. No. 567,677
Int. Cl.³ G08B *21/00*; H02K *3/487*
U.S. Cl. 310—214 **10 Claims**



1. A device for detecting electrical contact between the stator and rotor of an electric motor and disabling the rotor to minimize the damage between the rotor and stator, comprising a plurality of spaced elongated insulting wedges about the stator for retaining coils of electrical conductors located in spaces of a stator between teeth of stator and providing a generally uniform smooth face with the rotor facing surfaces of the stator teeth, a plurality of elongated spaced non-magnetic generally round electrical conductors extending across the face of the stator, said non-magnetic conductors being embedded substantially within the upper surface of selected ones of said insulation wedges at widely spaced circumferential locations around the face of the stator, said non-magnetic

conductors being fixed in said selected wedges in close proximity to the face of the rotor, insulation means overlying each of said non-magnetic conductors without inhibiting removal of said wedges from stator, said upper surface of said wedges containing said non-magnetic conductors and said insulation means being above the upper surfaces of the other of said wedges and above the face of the stator, means connected to said non-magnetic conductors for disabling the motor when the rotor causes a break in one of said insulation means and causes an electrical contact to be made between said rotor and one of said non-magnetic conductors beneath said one insulation means.

4,539,500

COMMUTATOR MOTOR AND IMPROVED BRUSH CONSTRUCTION FOR USE IN PORTABLE MACHINE TOOLS

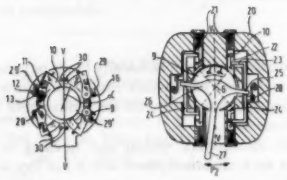
Jan P. Houben, Breda, and Antonie J. Moolenaar, Dorst, both of Netherlands, assignors to Skil Nederland B.V., Breda, Netherlands

Filed Feb. 18, 1983, Ser. No. 467,665

Claims priority, application Netherlands, Feb. 18, 1982, 8200652

Int. Cl.³ H02K *13/10*; B23B *45/02*

U.S. Cl. 310—230 **5 Claims**



1. A commutator motor such as a series motor and a permanent magnet motor to be incorporated in portable machine tools, preferably hand machine tools such as drills, said motor comprising a stator winding arranged in a machine housing and a rotor winding including a rotor shaft with a commutator ring journalled in said housing, and at least two pairs of diametrically opposite carbon brushes of different polarities, said brushes being supported in said machine housing such that each respective pair can be separately brought into contact with said commutator by a setting means comprising an element rotatable concentrically with said rotor shaft having a handle external to said housing for the appropriate positioning of said element, said element being provided with cams for engaging and lifting said brushes in order to invert the sense of rotation of said rotor.

4,539,501

EPITAXIAL STRUCTURE WITH INCREASED PIEZOELECTRIC EFFECT AND A SURFACE ACOUSTIC WAVE ELECTRONIC DEVICE COMPRISING SUCH A STRUCTURE

Linh N. Trong, Bourg La Reine, and Jean Chevrier, Gif-Sur-Yvette, both of France, assignors to Thompson-CSF, Paris, France

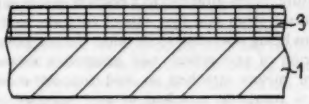
Filed Dec. 19, 1983, Ser. No. 563,251

Claims priority, application France, Dec. 30, 1982, 82 22065

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—313 A **10 Claims**

1. In an epitaxial structure with piezoelectric effect, comprising, supported by a semi-insulating substrate, a plurality of epitaxied layers, said epitaxied layers form two groups of layers, formed from two regularly alternated materials, the first material of the first group of layers having a crystalline mesh parameter equal to that of the substrate, the second material of the second group of layers having a crystalline mesh parameter different from that of the substrate and being more piezoelectric, the disharmony of the crystalline parameter between the substrate and the layers of the first group



imposing on the layers of said second group a constraint deforming the crystalline network which increases the piezoelectric effect.

4,539,502

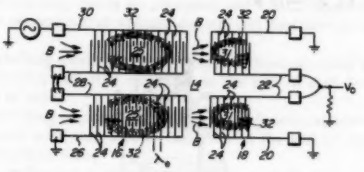
MAGNETIC FEEDTHROUGH CANCELLING SURFACE ACOUSTIC WAVE DEVICE

Grantley O. Este, Stittsville; Mark S. Suthers, Lanark, and Richard W. Streater, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 30, 1983, Ser. No. 567,332

Int. Cl.³ H03H *9/25*

U.S. Cl. 310—313 B **20 Claims**



1. A surface acoustic wave (SAW) device comprising an input transducer and an output transducer, the input transducer connected to a first reference potential point and to an input signal potential point, the output transducer connected to a second reference potential point and to an output signal potential point, one of the transducers having a plurality of loops, said input transducer functioning on application of an oscillatory signal at its signal potential point to generate a SAW and a magnetic flux, the SAW and the magnetic flux functioning to generate SAW induced voltage and magnetic flux induced voltage at the output transducer, both induced voltages having components corresponding to respective loops, the loops of said one transducer being so connected to one another and to the reference and signal potential points of said one transducer that at the output transducer signal potential point, the components of the magnetic flux induced voltage substantially cancel and the components of the SAW induced voltage add.

4,539,503

RAPID-HEATING, HIGH-TEMPERATURE-STABLE SPARK PLUG FOR INTERNAL COMBUSTION ENGINES

Friedrich Esper; Karl-Hermann Friese, both of Leonberg; Walter Gohl, Aidlingen, and Peter Sternad, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 21, 1982, Ser. No. 435,643

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144253

Int. Cl.³ H01T *13/14, 13/20*

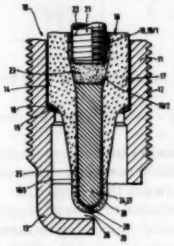
U.S. Cl. 313—11.5 **20 Claims**

1. Rapid-heating, high-temperature-stable, long-lifetime spark plug with self-adjusting variable heat conductivity, for an internal combustion (IC) engine, having

a combustion chamber end and an external connection end;

a hollow metal housing (11,12);

a chassis or ground electrode (30) connected to the metal housing at the combustion chamber end;
an insulator (18) sealingly retained in the hollow metal housing, and formed with a central opening (19) therein; and
a center electrode (21, 23, 24, 27, 28) located in the central opening (19) of the the insulator and including
a connection post (21);
a spark tip (27,28) located opposite the chassis or ground electrode (13), a solid metal spark plug core segment (24), electrically connected to the spark tip, and an electrical circuit connection means (23) for electrically connecting the metal core and the connection post,
wherein the solid metal core (24-24''') comprises a metal which is solid under all operating conditions of the spark plug, and said solid metal core is shaped to fit into the



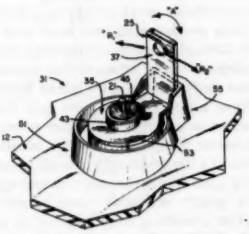
central opening (19) of the insulator and has a temperature coefficient of expansion such that,
(A) at temperatures above the deposit burn-off temperature of said insulator a major portion of the surface of the metal core (24) expands into surface engagement with the portion (19-19''') of the wall of the insulator (18) defining said opening therein, and such that,
(B) below said deposit burn-off temperature, said surface of said solid metal core is spaced from said portion of the wall surface of the insulator by a gap (25) thereby effecting rapid heating of said insulator to deposit burn-off temperature, by inhibiting rapid heat transfer from the insulator to said metal core, but preventing, by heat transfer to the center electrode including said metal core, excessive heating of the insulator tip portion to glow ignition temperature.

4,539,504

MOTOR VEHICLE HEADLIGHT WITH IMPROVED CONTACT LUG RETENTION MEANS

Robert J. Marshall, and Thu T. Le, both of Seymour, Ind., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 19, 1983, Ser. No. 459,271
Int. Cl.³ H01J *5/16*
U.S. Cl. 313—113 **8 Claims**



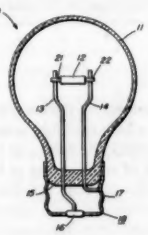
1. A motor vehicle headlight comprising:
a plastic reflector having a curved rear portion having at least one opening thereon, and a forward, open end portion;
a lens member secured to said open end portion of said reflector to provide a closure therefor;
an electric lamp disposed within said reflector and including a glass envelope, at least two lead-in wires projecting from said envelope, and at least two support wires, each of said wires being fixedly secured to a respective one of said lead-in wires and passing through said rear portion of said reflector; and
terminal means for being electrically connected to at least one of said support wires, said terminal means comprising a metallic eyelet located within said opening within said reflector, and a metallic lug member having a base segment and an upstanding leg segment, said eyelet being secured to said base segment of said lug at a first location, said curved rear portion of said reflector including an upstanding portion located about said opening having said eyelet therein, said upstanding portion including a substantially flat upper external surface and a retaining flange portion, said base segment of said metallic lug member positioned on said flat upper external surface of said upstanding portion and said retaining flange portion engaging at least two opposing surfaces of said upstanding leg segment of said lug member at a spaced, second location from said first location where said eyelet is secured to said base segment to provide a three point form of retention for said lug member such that tilting and rotational movement of said lug member relative to said first location is substantially prevented.

4,539,505

CANDOLUMINESCENT ELECTRIC LIGHT SOURCE

Leslie A. Riseberg, Sudbury, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 29, 1983, Ser. No. 489,879
Int. Cl.³ H01K *1/32*
U.S. Cl. 313—315 **6 Claims**



1. An electric lamp comprised of:
a light passing envelope;
at least two lead-in wires extending from the exterior to the interior of said envelope;
a filament supported within said envelope by said lead-in wires, said filament including a resistive core electrically coupled to said lead-in wires; and
a candoluminescent sheath at least partially surrounding said core; wherein
said resistive core is a sintered composition including carbon, ceric oxide, and thorium dioxide; and
said candoluminescent sheath is a sintered composition including ceric oxide and thorium dioxide.

4,539,506

RED-EMITTING SUPERLINEAR PHOSPHOR

Hiroko Ohtani, Sagamihara, Japan, and Kazuharu Toyokawa, Mahopac, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 19, 1983, Ser. No. 533,481
Int. Cl.[3] C09K 11/50
U.S. Cl. 313—467 8 Claims

1. A red-emitting phosphor which includes ZnSe as a host material, Cu as an activator and Al as a coactivator, and Co in amount sufficient to impart superlinear characteristics to said phosphor.

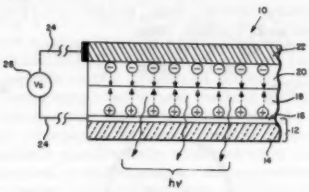
6. A phosphor screen for a current-sensitive, single-gun color CRT, comprising the mixture of a red-emitting superlinear phosphor ZnSe having Cu, and Al as activator and coativator respectively and a small concentration of, Co sufficient to render said phosphor superlinear and a green-emitting sublinear phosphor selected from Zn_2SiO_4: Mn and (Zn, Cd)S: Ag.

4,539,507

ORGANIC ELECTROLUMINESCENT DEVICES HAVING IMPROVED POWER CONVERSION EFFICIENCIES

Steven A. VanSlyke, and Ching W. Tang, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 25, 1983, Ser. No. 478,938
Int. Cl.[3] H01J 1/62
U.S. Cl. 313—504 9 Claims



1. In an electroluminescent device comprising, in sequence, an anode electrode, a hole-injecting zone, an organic luminescent zone, and a cathode electrode, at least one of said electrodes being capable of transmitting at least 80% of radiation having wavelengths longer than 400 nm,

the improvement wherein said luminescent zone comprises an electron-transporting compound that provides a maximum electroluminescent quantum efficiency of at least about 5×10^{-4} photons/electron, when used in a test device driven at no more than the lesser of (i) 25 volts and (ii) the voltage which produces the maximum power conversion efficiency of said device, said test device comprising (1) a hole-injecting zone consisting essentially of 1,1-bis-(4-di-p-tolylaminophenyl)cyclohexane, said hole-injecting zone and said luminescent zone having a combined thickness of no more than 1 micron, (2) an anode electrode that transmits at least 80% of radiation having wavelengths longer than 400 nm, and (3) an indium cathode,

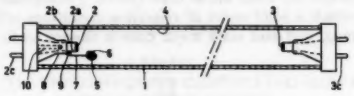
and wherein said device has a power conversion efficiency of at least 9×10^{-5} w/w and said zones have a combined thickness that is no greater than about 1 micron.

4,539,508

METHOD OF PRODUCING A LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

Berend J. Mulder, and Sybrandus van Heusden, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1982, Ser. No. 441,186
Claims priority, application Netherlands, Dec. 4, 1981, 8105464
Int. Cl.[3] H01J 61/28
U.S. Cl. 313—546 7 Claims



1. A method of producing a low-pressure mercury vapor discharge lamp:

providing a lamp vessel in which at least two electrodes are arranged;

providing the quantity of mercury required for operation of the lamp in a metal container disposed in a position in the lamp vessel between the electrodes;

attaching the container to a metal supporting element;

connecting the metal supporting element to one of the electrode lead-in wires of a first electrode by means of a metal connecting wire;

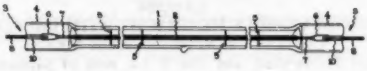
releasing mercury from the container by heating after evacuation of the lamp, said heating step being accomplished by a direct current discharge being temporarily generated between the container and a second electrode, whereby the container is heated and mercury is released from the container, whereafter the connection between the supporting element and the electrode lead-in wire is interrupted.

4,539,509

QUARTZ TO METAL SEAL

Arun K. Varshneya, Alfred, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 17, 1982, Ser. No. 450,576
Int. Cl.[3] H01J 5/36, 61/36; H01K 1/38
U.S. Cl. 313—623 1 Claim



1. An electric lamp wherein seal temperatures exceed 500° C. during lamp operation and subject the seal parts to both oxidation and contamination comprising:

a fused quartz tubular envelope having a molybdenum inlead construction pinch-sealed into both ends extending into said ends through openings extending into said envelope,

said molybdenum inlead construction consisting essentially of an inner molybdenum wire inlead flattened at its outer end to form a thin foil and with said foil portion being connected to an outer molybdenum terminal wire lead of larger diameter than said inner wire inlead, and connected to the ends of a longitudically extending tungsten filement,

and a sealing glass filling the space in said openings between the fused quartz and both outer terminal inleads, said sealing glass consisting essentially of, in parts by weight, 8–25 BaO, 20–35 B_2O_3, and 45–72 Sb_2O_3 except for incidental impurities, residual fluxes and refining agents, said sealing glass being molten at elevated temperatures above about 350° C. while solidifying to a frit condition at ordi-

nary temperatures and having a thermal expansion greater than said molybdenum metal.

4,539,510

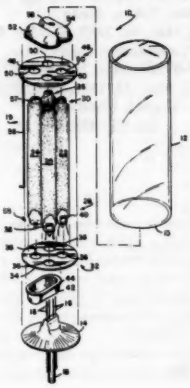
COMPACT FLUORESCENT LAMP

Andre Bouchard, Peabody, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 3, 1983, Ser. No. 538,407

Int. Cl.³ H01J *8/06*

U.S. Cl. 313—493 **3 Claims**



1. In a compact fluorescent lamp having a hermetically sealed outer envelope and an assembly of a plurality of phosphor coated tubes, at least some of said tubes having ends associated with a respective aperature in arc directing means, the improvement comprising: arc tight, depth regulating seating means formed on said ends of said at least some of said tubes for regulating the depth penetration of said at least some of said tubes through said respective aperture and for insuring an arc tight fit when said ends having a diameter relative to the diameter of said respective aperture engage a surface adjacent said respective aperture.

4,539,511

HIGH PRESSURE DISCHARGE LAMPS WITH MEANS FOR REDUCING RECTIFICATION

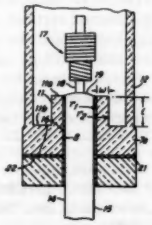
Paul L. Denbigh, Cossington; Richard J. Seddon, Rushey Mead, and Bryan F. Jones, Leicester, all of England, assignors to Thorn EMI plc, London, England

Filed Sep. 3, 1982, Ser. No. 414,925

Claims priority, application United Kingdom, Sep. 4, 1981, 8126865; Sep. 18, 1981, 8128262; Jun. 7, 1982, 8216518

Int. Cl.³ H01J *61/073, 61/20, 61/22, 61/36*

U.S. Cl. 313—624 **11 Claims**



1. A high pressure discharge lamp including a discharge tube having an arc wall of light transmitting ceramic material; a discharge sustaining fill within the discharge tube, the fill comprising a mixture of alkali metal and mercury vapour, and a quantity of starting gas, said mixture being condensable to provide an electrically conductive amalgam; electrodes within the discharge tube for initiating and maintaining a discharge; electrically conductive lead-in members joined within the discharge tube to respective electrodes for rendering the electrodes connectable to an electric supply; at least one end closure member sealed to an end of the discharge tube; and barrier means within the discharge tube preventing liquid amalgam, which is a condensate of said condensable mixture, from making electrical contact with the respective electrode and thereby the supply; the end closure member comprising an annular sealing element of said ceramic material extending radially inwardly of the arc tube wall and being sealed to the arc tube wall to define an end wall thereof having an aperture therein wherein a respective lead-in member is disposed in the aperture, to be connected within the arc tube to the respective discharge maintaining electrode, and has the barrier means disposed therearound in the form of a shoulder member between 1.5 and 1.4 mm in height and spaced from the arc tube wall, extending axially inwardly of the end wall to define an extension to the aperture and having a top surface facing inwards of the end of the arc tube, the respective lead in member being sealed along the aperture and extension thereof, the shoulder member being disposed and adapted to expose at least part of the respective end wall to radiation from the respective discharge maintaining electrode and the height and width of the shoulder member being arranged to provide a temperature differential due to lamp operation such that liquid amalgam will condense on the end wall in preference to the top surface.

4,539,512

TRAVELING-WAVE TUBE WITH PERIODIC PERMANENT-MAGNET FOCUSSING SYSTEM

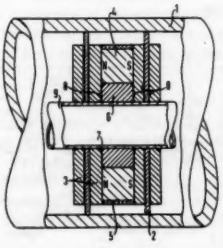
Hinrich Heynisch, Gräfelfing, and Eckart Schmid, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 28, 1983, Ser. No. 489,507

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 3216250

Int. Cl.³ H01J *23/08*

U.S. Cl. 315—5.35 **2 Claims**



1. Traveling-wave tube having a cylindrical vacuum envelope surrounded by a permanent-magnet system of ring-shaped pole washers and magnet rings respectively disposed therebetween and having opposite polarizations alternatingly in axial direction, comprising spacer rings formed of nonmagnetic material surrounding the cylindrical vacuum envelope and spacing the magnet rings therefrom, corresponding magnet rings and spacer rings being soldered together into respective strong and stable units and respective heat removing washers disposed between adjacent pairs of the pole washers.

4,539,513

CIRCUIT ARRANGEMENT FOR STARTING AND OPERATING A HIGH-PRESSURE GAS DISCHARGE LAMP

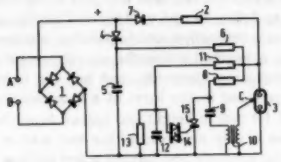
Hans G. Ganser, Stolberg; Ralf Schäfer, Aachen, and Hans P. Stormberg, Stolberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 25, 1983, Ser. No. 555,225

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3245923

Int. Cl.³ H05B *37/00*

U.S. Cl. 315—176 **9 Claims**



1. A circuit arrangement for starting and operating a high-pressure gas discharge lamp having an outer starting electrode comprising, means connecting the discharge lamp in series with a current limiter to a voltage source, a starting-pulse producer which comprises a pulse transformer connected on the secondary side to the starting electrode and on the primary side to a pulse capacitor and to a controlled switching element, characterized in that the voltage source is a full-wave rectifier connected to an alternating voltage supply and having an output shunted by a series arrangement of a diode and a further capacitor which is discharged at least in part through the lamp after each half period of the alternating voltage, a resistor, which is high-ohmic with respect to the current limiter, connected in the current circuit between the end of said capacitor facing the diode and the lamp.

4,539,514

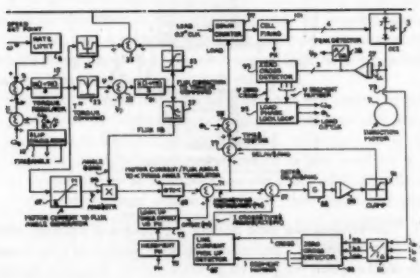
START-UP CONTROL FOR AN INDUCTION MOTOR DRIVE

Paul M. Espelage, Salem, and James M. Nowak, Roanoke, both of Va., assignors to General Electric Company, Salem, Va.

Filed Jul. 2, 1984, Ser. No. 627,000

Int. Cl.³ H02P *1/30*

U.S. Cl. 318—778 **11 Claims**



1. A method of starting an AC motor from any initial speed using open loop central, comprising the steps of:

providing sufficient current to the AC motor so that motor flux can be developed;

varying the frequency provided to the stator of the AC motor;

determining the stator frequency at which motor peak flux occurs; and

transitioning to a control responsive to an external command at approximately the stator frequency at which the peak flux occurred.

4,539,515

VEHICULAR DIRECT-CURRENT THREE-WIRE ELECTRIC SYSTEM

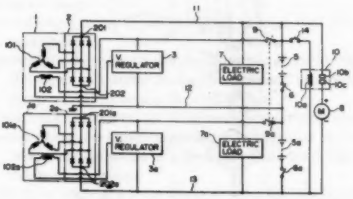
Mitsuharu Morishita; Mitsuyoshi Yokota, and Akio Matsumoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,829

Claims priority, application Japan, Mar. 18, 1982, 57-44027; Mar. 23, 1982, 57-47914; Mar. 23, 1982, 57-42004[U]; Mar. 23, 1982, 57-42007[U]; Mar. 23, 1982, 57-42006[U]; Mar. 23, 1982, 57-42005[U]; Apr. 9, 1982, 57-60747

Int. Cl.³ H02J *7/16*

U.S. Cl. 320—17 **15 Claims**



1. A direct-current three-wire electrical system for a vehicle, comprising: an alternating-current generator including first and second field coils magnetically separated from each other, a first armature coil facing said first field coil, a second armature coil facing a second field coil; a first rectifier for rectifying the a.c. output of the first armature coil; a second rectifier for rectifying the a.c. output of said second armature coil; a first storage battery connected between the plus and minus output terminals of said first rectifier; a second storage battery connected between the plus and minus output terminals of said second rectifier; a starting motor connected between the plus output terminal of said first rectifier and the minus output terminal of said second rectifier; a first voltage regulator for controlling the output voltage of said first armature coil to a first predetermined value by detecting the rectified output voltage between the plus and minus output terminals of said first rectifier to control the field current flowing in said first field coil; a second voltage regulator for controlling the output voltage of said second armature coil to a second predetermined value by detecting the rectified output voltage between the plus and minus output terminals of said second rectifier to control the field current flowing through said second field coil; a neutral conductor or a body grounded conductor connecting in common the minus output terminal of said first rectifier and the plus terminal of said second rectifier, and the minus terminal of said first storage battery and the plus terminal of said second storage battery; and switching means associated with said first and second storage batteries for connecting said first voltage regulator and said second voltage regulator in circuit with said first battery and said second battery, respectively.

4,539,516

SOLAR BATTERY ENERGIZER

Marion E. Thompson, c/o Solarts, Inc., 2807 N. Prospect, Colorado Springs, Colo. 80907

Filed Mar. 9, 1984, Ser. No. 588,109

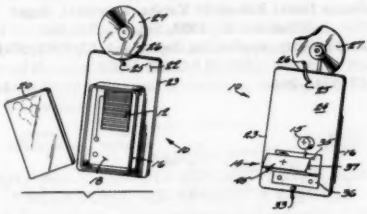
Int. Cl.³ H02J *7/00*

U.S. Cl. 320—48 **17 Claims**

1. A battery energizer comprising:

solar cell means for generating a small current when light impacts thereon;

terminal means for releasably receiving a button battery therein and, comprising: a first conductive plate physically mounted so that it is stationary with respect to said solar cell means; and a generally L-shaped second conductive plate, including a cantilevered spring portion, said second plate mounted so that said cantilevered spring portion is generally parallel to, and spaced from, said first



terminal plate; said first and second terminal plates being electrically connected only when a button battery is disposed between said cantilevered spring portion of said second plate and said first plate; and

means for allowing passage of current from said solar cell means to a button battery received by said terminal means, but not vice versa.

2. A battery energizer as recited in claim 1 wherein said current passage allowing means comprises a light emitting diode.

4,539,517

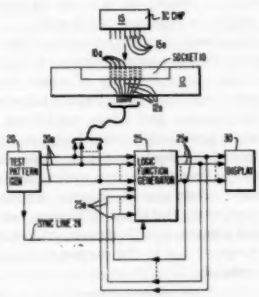
METHOD FOR TESTING AN INTEGRATED CIRCUIT CHIP WITHOUT CONCERN AS TO WHICH OF THE CHIP'S TERMINALS ARE INPUTS OR OUTPUTS

Laurence P. Flora, Covina, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 7, 1982, Ser. No. 447,733

Int. Cl.³ G01R *31/28*

U.S. Cl. 324—73 R **11 Claims**



1. In a method for testing an electrical circuit having input and output terminals with significantly different input and output impedances, the steps comprising:

applying a test pattern comprised of a plurality of logical signals to the terminals of a circuit to be tested in a manner such that a circuit input terminal will be driven to an acceptable logical level with the resulting signal obtained thereon being recognizable as having the same logical value as the respective test logical signal applied thereto, and such that a circuit output terminal will have a resulting signal thereon which is recognizable as having the same logical value as would normally be produced thereon in response to the test logical signals applied to the input terminals of the circuit; and

monitoring the resulting logical signal pattern appearing on the input and output terminals of a circuit being tested in response to said test pattern.

4,539,518

SIGNAL GENERATOR FOR DIGITAL SPECTRUM ANALYZER

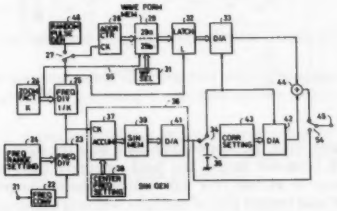
Hitoshi Kitayoshi, Gyoda, Japan, assignor to Takeda Riken Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1983, Ser. No. 533,780

Claims priority, application Japan, Sep. 24, 1982, 57-167370

Int. Cl.³ G01R *23/16*

U.S. Cl. 324—77 B **14 Claims**



1. A signal generator for a digital spectrum analyzer in which a test signal from the signal generator is supplied to a device under test and a signal therefrom is sampled and input into a fast Fourier transform analyzer for analysis, comprising:

clock generating means for generating a clock signal synchronized with the input of the sampled signal into the fast Fourier transform analyzer;

an address counter for counting the clock signal generated by the clock generating means and providing a corresponding count value;

a waveform memory connected to the address counter and read out with said count value used as an address, the waveform memory having stored therein, as a digital value, the amplitude value at each of equally spaced points of a composite waveform of a plurality of predetermined spectra divided in the time-axis direction by an integral multiple of the number of sample points necessary for one analysis by the fast Fourier transform analyzer; and

a D/A converter connected to the output side of the waveform memory, for converting the output read out therefrom into an analog signal for output as the test signal.

4,539,519

FIBER OPTICS DEVICE FOR MEASURING THE INTENSITY OF AN ELECTRIC CURRENT UTILIZING THE FARADAY EFFECT

Reinhard Ulrich, Buchholz, Fed. Rep. of Germany, and Scott C. Rashleigh, Alexandria, Va., assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,203

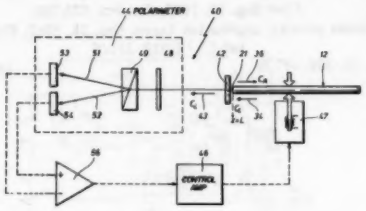
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116149

Int. Cl.³ G01R *33/00, 19/00*

U.S. Cl. 324—117 R **16 Claims**

1. A fiber optics device for measuring the intensity of an electric current along a current path using the Faraday effect, said device including an optical fiber having first and second ends which fiber surrounds the current path in a number of windings to mark an optical path which is exposed to the magnetic field of the current, wherein when a light flux generated by a light source and having a defined polarization state is

fed into the fiber at its first end, a current-dependent alteration of this polarization state is produced along this optical path because of the Faraday effect, and wherein said device further includes a polarization measurement unit by which the polarization state of the light can be detected after it has traversed the optical path subjected to the magnetic field, and by which a polarization measurement signal characteristic of the current intensity can be generated, wherein the device further comprises an adaptive reflection unit located, substantially, at the second end of the optical fiber which reflection unit comprises a partially transparent mirror reflecting a first part of the light



emerging from the second end back into the fiber, and transmitting a second part of the light emerging from the second fiber end to an analyzer unit which detects the polarization state of said second part of the light which is transmitted by the mirror and generates an output signal which is characteristic of this polarization state, and wherein the reflection unit further comprises a polarization servo means which receives the output signal of the analyzer unit as a control signal and which acts on the optical fiber to adjust the polarization state of the light emerging from the second end of the fiber to maintain the polarization state of the light transmitted and reflected by the mirror at a linear polarization state.

4,539,520

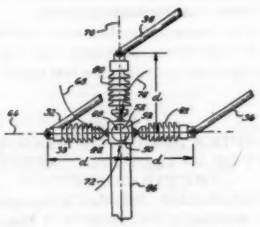
REMOTE CURRENT DETECTOR

Joseph R. McBride, Mauldin, S.C., assignor to Bridges Electric, Inc., Heber Springs, Ark.

Division of Ser. No. 239,344, Mar. 2, 1981, Pat. No. 4,408,155. This application Jul. 13, 1983, Ser. No. 513,331

Int. Cl.[3] **G01R** *33/00, 19/00*

U.S. Cl. 324—117 H **3 Claims**



1. A remote current sensor for monitoring the current flowing through a conductor, said sensor to be positioned in a magnetic field surrounding the conductor, comprising:

a Hall effect transducer for measuring the magnetic field surrounding said conductor;

a pair of tapered pole pieces with said transducer positioned therebetween, each of said pole pieces being made of a ferromagnetic material and having a wide cross sectional area at one end to pick up a low density magnetic flux in the air and a small cross sectional area at the opposite end adjacent to the transducer to concentrate said low density magnetic flux into a high density magnetic flux focused onto the transducer, the transducer and pole pieces being positioned at a location removed from the conductor greater than the electric arcing distance for the voltage at which the conductor is normally operated; and

a grounded aluminum housing for said sensor to shield the sensor from electric fields.

4,539,521

MAGNETIC FIELD MEASURING DEVICE

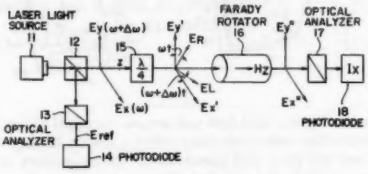
Mitsuo Matsumoto, Kokubunji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 22, 1983, Ser. No. 516,464

Claims priority, application Japan, Jul. 27, 1982, 57-129524

Int. Cl.[3] **G01R** *33/02*

U.S. Cl. 324—244 **2 Claims**



1. A magnetic field measuring device comprising:

a laser light source for delivering laser light having x and y axes components having a first frequency and a second frequency, respectively;

a beam splitter for dividing said laser light into first and second portions;

a first optical analyzer provided to receive the first portion delivered from the beam splitter for delivering a component polarized at an angle of 45° with respect to the x and y axes, and the optical intensity of which being modulated at a frequency corresponding to the difference of said first and second frequencies, and having reference phase;

a quarter wave plate provided to receive the second portion delivered from the beam splitter for delivering an output, the principal axis direction of which being set at an angle of 45° with respect to x and y axes;

a Faraday rotator for receiving the output of said quarter wave plate for rotating the same by an angle corresponding to a magnetic field applied thereto;

a second optical analyzer for extracting from the output of the Faraday rotator a predetermined polarization component, and the optical intensity of which being modulated at a frequency equal to the difference between the first and second frequencies, and phase modulated by twice the rotated angle produced by said Faraday rotator;

first and second photoelectric converters for converting outputs of the first and second optical analyzers into first and second electric signals, respectively; and

means for comparing the phase difference between said first and second electric signals thereby to produce an output directly proportional to the magnetic field applied to the Faraday rotator.

4,539,522

MAGNETIC DETECTOR APPARATUS WITH LIQUID-SUPPORTED, CONDUCTIVE, SENSOR-SUPPORT TUBE

Erick O. Schonstedt, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

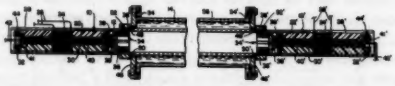
Filed Jun. 23, 1982, Ser. No. 391,441

Int. Cl.[3] **G01R** *33/02, 33/022, 33/04;* **G01V** *3/08*

U.S. Cl. 324—245 **5 Claims**

1. Magnetic detector apparatus including a pair of substantially aligned magnetic sensor assemblies supported at axially spaced positions in an elongated sensor tube of sufficient length

such that gravitational forces tend to distort the tube when it is disposed horizontally and cause misalignment of the sensor assemblies, characterized in that the apparatus includes means supporting the sensor tube in a liquid bath over a substantial



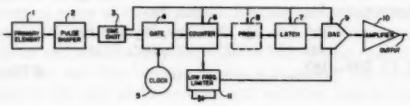
part of its length between said sensor assemblies, with the length of the sensor tube substantially horizontal and with the interior of the sensor tube isolated from the liquid, for resisting said gravitational forces and maintaining the alignment of said sensor assemblies.

4,539,523

FREQUENCY TO VOLTAGE CONVERTER FOR A PREDETERMINED FREQUENCY RANGE

John B. Rosso, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 6, 1983, Ser. No. 501,683
Int. Cl.³ H03K *9/06, 5/26*
U.S. Cl. 328—141 **5 Claims**



1. A circuit responsive to a predetermined range of electrical pulse frequencies, including,

a primary element responding to a physical state by generating a first train of electrical pulses whose variation in frequency represents changes in the physical state,

a shaper circuit receiving the first train of electrical pulses and outputting each pulse with at least one sharp actuating edge,

a one-shot monostable multivibrator connected to the shaper circuit to receive the first train of pulses and apply the sharp actuating edge of each pulse to produce a second train of electrical pulses with each pulse having a duration equal to the period of the maximum frequency of the first train pulses, a gate connected to the one-shot to receive the second train of pulses with intervals between the pulses of the second train representing those frequencies of the first train pulses less than their maximum frequency,

a source generating a third train of pulses connected to the gate in an arrangement whereby the output of the gate is the third train of pulses of stable frequency during the intervals between pulses of the second train,

a binary counter connected to the gate to receive each group of stable pulses passed by the gate and convert each group into a binary word,

and means connected to the binary counter to convert each word into a manifestation of the frequency represented by the word.

4,539,524

METHOD AND COHERENT DEMODULATORS FOR MSK SIGNAL

Steven H. Goode, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

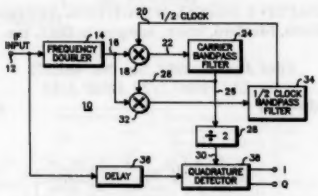
Filed Dec. 30, 1983, Ser. No. 567,119
Int. Cl.³ H04L *27/14*
U.S. Cl. 329—50 **9 Claims**

1. A coherent demodulator for processing a received binary data modulated signal of substantially constant amplitude and continuous phase and carrying binary data at a predetermined bit rate, said demodulator comprising:

means for frequency doubling the received signal;

means for generating a half clock signal;

means for multiplying said frequency doubled signal with said half clock signal to produce a coherent carrier term signal;



means for bandpass filtering said coherent carrier term signal;

divider means coupled to the output of said bandpass filtering means for providing a coherent carrier output signal; and

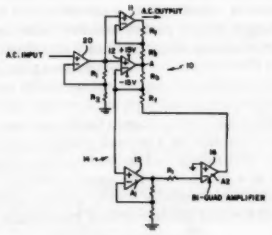
detector means for utilizing said generated coherent carrier signal and the received binary data modulated signal for recovering the binary data therefrom.

4,539,525

BAND-PASS AMPLIFIER FILTERS

Neil L. Brown, Bourne, Mass., assignor to Neil Brown Instrument Systems, Inc., Cataumet, Mass.

Filed Sep. 24, 1982, Ser. No. 422,732
Int. Cl.³ H03F *3/04, 1/34*
U.S. Cl. 330—107 **11 Claims**



1. An amplifier-filter circuit for amplifying and filtering an input signal, comprising:

an amplifier circuit, having inverting and non-inverting inputs and a high gain factor, for providing an output signal representative of the difference between signals applied to the inverting and non-inverting inputs;

feedback resistance means, connected between the output and the inverting input of the amplifier means, for providing a selected resistance;

means for applying the input signal to the amplifier means non-inverting input;

active filter circuit means, responsive to a signal applied to an input thereto and having a bandpass transfer function centered around a selected resonance frequency, for providing a filtered output signal at an output thereof;

second means for applying the signal at the amplifier means inverting input to the active filter circuit means input; and

coupling resistance means, connected between the active filter circuit means output and the amplifier circuit inverting input, and having a resistance less than said first feedback resistance means;

the active filter circuit means, second means for applying,

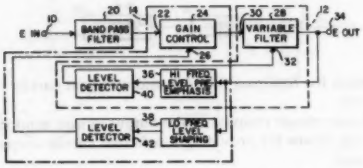
and coupling resistance means being connected between the amplifier circuit inverting input and ground so as to provide a variable impedance which appears as a series-resonant tuned filter having a resonance frequency substantially equal to said selected resonance frequency.

4,539,526

ADAPTIVE SIGNAL WEIGHTING SYSTEM

Mark F Davis, Medford, Mass., assignor to DBX, Inc., Newton, Mass.

Filed Jan. 31, 1983, Ser. No. 462,372
Int. Cl.³ H03G *3/20*; H03F *3/68*
U.S. Cl. 330—144 **39 Claims**



1. An adaptive signal weighting system: including a signal path for transmitting an electrical information signal of a predetermined bandwidth through said system, said system further comprising:

filter means disposed in said signal path for varying the gain impressed on the portion of said information signal within a first select spectral region within said predetermined bandwidth by a first variable gain factor, said first variable gain factor varying in response to and as a function of a first control signal;

means for generating said first control signal only in response to and in accordance with the signal energy of said information signal within a second select spectral region including at least a part of said first select spectral region;

gain control means disposed in said signal path and coupled to said filter means for varying the signal gain impressed on said information signal substantially throughout said predetermined bandwidth by a second variable gain factor, said second variable gain factor varying in response to and as a function of a second control signal; and

means for generating said second control signal in response to and as a function of the signal energy of said information signal substantially within a third select spectral region within said predetermined bandwidth.

4,539,527

NOISE REDUCTION BY LINEAR INTERPOLATION USING A DUAL FUNCTION AMPLIFIER CIRCUIT

Yukinobu Ishigaki, Tokyo, and Kazutoshi Hirohashi, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Jul. 27, 1984, Ser. No. 635,352
Claims priority, application Japan, Jul. 30, 1983, 58-140241; Aug. 17, 1983, 58-150045
Int. Cl.³ H03F *1/26*; H04B *1/10*
U.S. Cl. 330—149 **6 Claims**

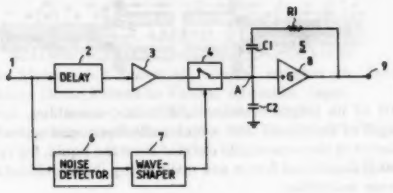
1. A noise reduction circuit having an input terminal to which an information signal is applied and an output terminal, comprising:

means connected to said input terminal for detecting a noise impulse introduced in said information signal and generating therefrom a sampling pulse time-coincident with the portion of the signal affected by said noise impulse;

a switch connected in a circuit path between said input and output terminals for passing said information signal therethrough in the absence of said sampling pulse and blocking said signal in response to said sampling pulse;

a noninverting amplifier connected in said circuit path between said switch and said output terminal for amplifying said signal;

a differentiator including a resistor and a first capacitor connected from the output of said noninverting amplifier to the input thereof; and



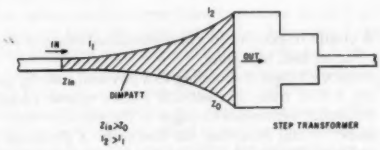
a second capacitor connected to said first capacitor forming a node at the input of said noninverting amplifier for storing a voltage from said switch and a voltage from said differentiator when said signal is blocked.

4,539,528

TWO-PORT AMPLIFIER

Burhan Bayraktaroglu, Plano; Bumman Kim, and William Frensley, both of Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1983, Ser. No. 528,201
Int. Cl.³ H03F *3/60*; H03C *7/38*
U.S. Cl. 330—287 **6 Claims**



1. A microwave amplifier comprising:

a semiconductor diode having top and bottom contact and an active region inbetween, said semiconductor diode being prolonged to define a transmission line;

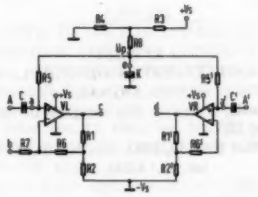
said transmission line being tapered, so that said semiconductor diode active region is narrower at a first end thereof than at a second end thereof.

4,539,529

SEMICONDUCTOR AMPLIFIER CIRCUIT

Michael Lenz, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Muenchen, Fed. Rep. of Germany

Filed Sep. 15, 1983, Ser. No. 532,722
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1982, 3234400
Int. Cl.³ H03F *3/68, 3/45*
U.S. Cl. 330—295 **7 Claims**



1. Semiconductor amplifier circuit, comprising first and

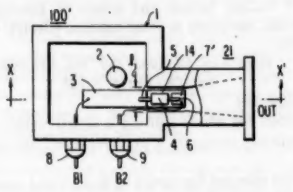
second operational amplifiers each having an inverting input, a non-inverting input and an output, a reference potential source, a supply potential source, a first voltage divider formed of two series-connected resistors connected between said output of said first operational amplifier and said reference potential source, a second voltage divider formed of two series-connected resistors connected between said output of said second operational amplifier and said reference potential source, each of said voltage dividers having a divider point between said resistors thereof, a first resistor connected between said divider point of said first voltage divider and said inverting input of said first operational amplifier forming a real negative feedback, a second resistor connected between said divider point of said second voltage divider and said inverting input of said second operational amplifier forming a real negative feedback, a first signal input terminal of the amplifier circuit connected to said non-inverting input of said first operational amplifier, a second signal input terminal of the amplifier circuit connected to said non-inverting input of said second operational amplifier, a third common voltage divider connected between said reference potential source and said supply potential source, said common voltage divider including two resistors defining a divider point therebetween, a common intermediate resistor connected to said divider point of said common voltage divider, and first and second supply resistors connected in series with said intermediate resistor, said first supply resistor being connected between said intermediate resistor and said non-inverting input of said first operational amplifier, said second supply resistor being connected between said intermediate resistor and said non-inverting input of said second operational amplifier, said first resistor having a resistance substantially equal to the sum of the resistance of said first supply resistor and twice the resistance of said intermediate resistor, and said second resistor having a resistance substantially equal to the sum of the resistance of said second supply resistor and twice the resistance of said intermediate resistor.

4,539,530

TRANSISTORIZED MICROWAVE OSCILLATOR OF OSCILLATION FREQUENCY MULTIPLYING TYPE

Motoo Mizunura, and Kenzo Wada, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,541
Claims priority, application Japan, Mar. 29, 1982, 57-50789
Int. Cl.³ H03B 5/00
U.S. Cl. 331—117 FE **18 Claims**



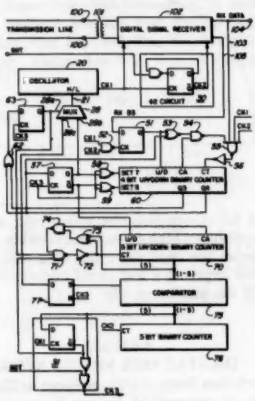
1. A transistorized microwave oscillator comprising: oscillating means, including a transistor for oscillation and feedback means, for generating a fundamental oscillating frequency and harmonic components thereof; and a cutoff waveguide connected to said oscillating means for cutting off at least said fundamental oscillating frequency to provide a needed harmonic, wherein a part of said feedback means comprises means for coupling said oscillating means to said cutoff waveguide.

4,539,531

PHASE LOCKED LOOP VARIABLE OSCILLATOR WITH SWITCHED CAPACITORS

Terence N. Thomas, and John G. Hogeboom, both of Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 26, 1983, Ser. No. 535,725
Int. Cl.³ H03L 7/00
U.S. Cl. 331—11 **12 Claims**



3. A clock circuit for synchronous operation in relation to transitions in a received signal, comprising:

an amplifier with terminal means for connecting a tank circuit between an input and an output of the amplifier;

a passive reactance element;

switch means being operable for connecting and for disconnecting the reactance element across the amplifier whereby in combination with the tank circuit an oscillator circuit is provided and is operable at either of first and second frequencies;

a phase detector being responsive to the transitions for indicating a corresponding phase relationship of an oscillatory signal from the oscillator circuit; and

means for generating a control signal for operating the switch means in response to indications from the phase detector, the means for generating the control signal comprising:

means for generating a time signal in response to the oscillatory signal, the time signal having a period being an integer multiple of the period of the oscillatory signal;

means for generating a fast control signal, being of a consistent state through the period of the time signal, in response to the indication from the phase detector also being of a consistent state;

means for generating the slow control signal being of alternate states through the period of time signal wherein a duration of each of the states is determined in response to a ratio of the duration of corresponding states of the fast control signal through a preceding plurality of time signal periods; and

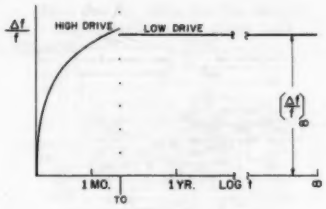
a selection circuit for coupling the fast control signal to the switch means in response to an indication that the indication from the phase detector has been substantially constant in the preceding period of the time signal and for otherwise coupling the slow control signal to the switch means.

4,539,532

METHOD OF MINIMIZING THE AGING RATE OF AN OSCILLATOR

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 23, 1984, Ser. No. 603,253
Int. Cl.³ H03B 5/32
U.S. Cl. 331—69 **6 Claims**



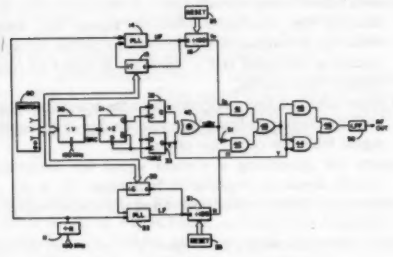
1. Method of minimizing the aging rate of an oscillator comprising applying a high drive current to the resonator early in the oscillators life until the aging rate decreases to a low value and then applying a low drive current to the resonator for the rest of the oscillators life.

4,539,533

DIGITAL MSK MODULATOR

Don M. French, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1981, Ser. No. 250,777
The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.
Int. Cl.³ H04L 27/12; H03K 7/06
U.S. Cl. 332—9 R **14 Claims**



1. A digital minimum-shift-keying modulator, comprising:

oscillatory circuit means responsive to a master clock signal of fixed frequency for providing a first digital waveform of variable frequency and a second digital waveform of variable frequency not equal to the first, wherein the first and second frequencies are related in a predetermined manner;

processing circuit means responsive to a serial stream of digital data, the data stream having a variable clock frequency, f_m, and comprising successive bit periods, the processing circuit means separating the serial stream into two substreams each having a clock frequency $f_m/2$, one substream comprising the succession of even-numbered bit periods of the serial stream and the other substream comprising the succession of odd-numbered bit periods of the serial stream; and

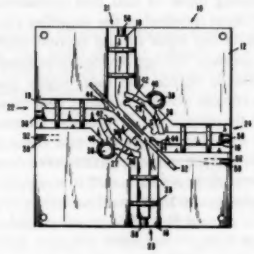
combining circuit means coupled to the oscillatory means and the processing means for selecting one digital waveform when the states of the substreams are equivalent or the other digital waveform when the states of the substreams are opposite, and for responding to the state of one substream when the selection is made to provide either the selected waveform or its inverse as an output.

4,539,534

SQUARE CONDUCTOR COAXIAL COUPLER

Thomas Hudspeth, Malibu; Richard V. Basil, Jr., Chatsworth, and Harmon H. Keeling, Lake Isabella, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Feb. 23, 1983, Ser. No. 468,826
Int. Cl.³ H01P 5/18
U.S. Cl. 333—115 **9 Claims**



1. The microwave coupler comprising:

(a) a set of ports, each of said ports being formed of coaxial transmission lines having inner and outer conductors of rectangular shape cross-section;

(b) pairs of said ports being joined by transmission line segments having inner and outer conductors;

(c) a dielectric frame located between said inner conductors of said transmission line segments for separating said inner conductors by a fixed distance preselected to permit coupling of microwave energy between said segments;

(d) at least one electrically conductive spring disposed in an outer conductor of at least one of said line segments at a site of minimal electric field strength; and

(e) means connecting said at least one spring with the inner conductor of one of said line segments for urging together said inner conductors of said line segments against said dielectric frame for maintaining said distance.

4,539,535

FOUR PORT PHASE SHIFTER

Coleman J. Miller, Arnold, and Robert R. Barron, Greenbelt, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 12, 1983, Ser. No. 522,899
Int. Cl.³ H01P 1/185
U.S. Cl. 333—164 **12 Claims**

1. A circuit for phase shifting a signal within a predetermined frequency range by a predetermined amount comprising:

a first port adapted for coupling to an input signal and coupled through a first impedance to a second port,

said second port adapted for providing an output signal,

said first port coupled through a second, third and fourth impedance respectively in series to a third port,

said second port coupled through a fifth, sixth and seventh impedance respectively in series to a fourth port,

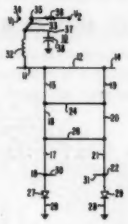
an eighth impedance coupled between the junction of said second and third impedances and the junction of said fifth and sixth impedances,

a ninth impedance coupled between the junction of said

third and fourth impedances and the junction of said sixth and seventh impedances,

said first, second, third, fourth, eighth and ninth impedances each having an impedance substantial different from one another,

a first diode coupled to said third port,



a second diode coupled to said fourth port, and

means for biasing said first and second diodes to provide a tenth and eleventh diode impedance respectively at first times and to provide a twelfth and thirteenth diode impedance respectively at second times.

4,539,536

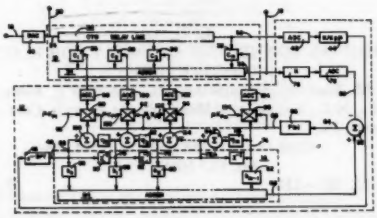
PARAMETER-SETTING APPROACH TO OBTAIN HIGH PERFORMANCE CTD TRANSVERSAL FILTERS FROM DEVICES WITH SIGNIFICANT CTI AND FPN

Stanley A. White, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 12, 1982, Ser. No. 441,195

Int. Cl.³ H03H *15/02, 17/02*

U.S. Cl. 333—165 **11 Claims**



6. For a charge-transfer-device (CTD) transversal filter including input terminal means for receiving test signals representative of a pseudo-random-noise sequence, output terminal means for providing a filtered output signal having a particular frequency response, a tapped delay line interconnected with said input terminal means and having a plurality of series connected, charge-storage cells having tapped outputs responsive to said cells, and a plurality of tap-weighting gain stages respectively connected to said charge-storage cells to set the tap-weight coefficients of said cells,

the improvement of a tap-weight-coefficient adjustment circuit to selectively adjust the tap-weight coefficients of each of said gain stages for generating the filtered output signal having the particular frequency response, said adjustment circuit connected in feedback relationship between the last charge-storage cell of said tapped delay line and said gain stages and comprising a reference transversal filter for receiving an unfiltered signal from said tapped delay line and providing a reference output signal in response to the test signals at said CTD transversal filter input terminal means, and

means for setting the tap-weight coefficients of said gain stages in response to the difference between the reference output signal provided by said reference transversal filter and said filtered output signal provided by said CTD transversal filter, the characteristic charge-transfer inefficiencies of the charge-storage cells of said tapped delay line, and the response of said charge-storage cells to the test signals applied to said CTD transversal filter input terminal means.

4,539,537

TRANSVERSAL FILTER HAVING PARALLEL INPUTS

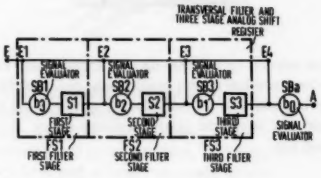
Hans-Joerg Pfleiderer, Zorneding, and Karl Knauer, Kirshseon, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 31, 1983, Ser. No. 499,483

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1982, 3235744

Int. Cl.³ H03H *15/02*

U.S. Cl. 333—165 **7 Claims**



1. A transversal filter, comprising:

an analog shift register having a plurality of parallel inputs and a serial output;

a signal input which supplies an input signal to all parallel inputs so that the input signal forms successively sampled signal values;

a serial output where a filtered output signal is available;

n signal evaluator means and n parallel inputs being respectively allocated to a group of n stages of the shift register;

the signal evaluator means in each stage being positioned in a signal path between the respective parallel input and the respective stage, and preceding stages connecting to succeeding stages through an intervening signal evaluator means;

the signal evaluator means of the first through n^{th} stages of said group respectively evaluating according to evaluation factors b_n through b_1 which are determined such that the filtered signal corresponds to a system function

$$H(z)=b_0(1+b_1\cdot z(1+b_2z(\ldots(1=b_n\cdot z))),$$

where z represents a respective delay associated with one stage of the shift register when the sampled signal values are transferred, and b_0 represents an evaluation factor of a signal evaluator means between the serial output and a last stage of the shift register.

4,539,538

MOLDED CASE CIRCUIT BREAKER WITH MOVABLE UPPER ELECTRICAL CONTACT POSITIONED BY TENSION SPRINGS

Robert H. Flick, Brighton Township, Beaver County, and Walter K. Huffman, Towamencin Township, Montgomery County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 19, 1983, Ser. No. 562,648

Int. Cl.³ H01H *75/00*

U.S. Cl. 335—16 **15 Claims**

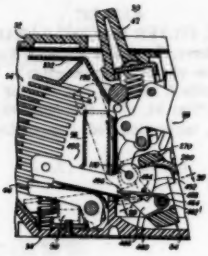
12. An electrical circuit breaker comprising:

a first movable electrical contact having a slot formed therein;

a second electrical contact; and

spring means for biasing said first electrical contact, said spring means comprising:

a spring biased locking pin at least partially disposed in said slot in contact with said first contact at some portion thereof along the periphery of said slot, said pin capable of being removed from within said slot;



a first tension spring biasing said locking pin; and

a second tension spring biasing said pin, said first tension spring and said second tension spring being secured to said pin at spaced apart locations along the length of said pin.

4,539,539

ELECTROMAGNETIC RELAY AND METHOD FOR ADJUSTING THE ARMATURE THEREOF

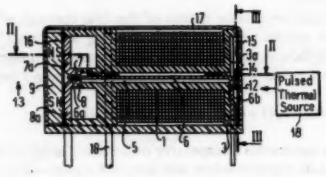
Josef Schweiger, and Bernhard Hering, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 23, 1983, Ser. No. 535,036

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240184

Int. Cl.³ H01H *51/22*

U.S. Cl. 335—78 **5 Claims**



1. An electromagnetic relay comprising:

a hollow coil body having two end flanges and a central section therebetween about which a coil having a longitudinal coil axis is wound;

at least one pole piece disposed at one of said flanges;

a tongue armature extending through said coil body substantially along said longitudinal coil axis having a free end movable relative to said pole piece and having an additional spring section extending substantially perpendicular to said coil axis at the other of said end flange; and

means connecting said additional spring section to said other of said end flanges incuding a first fastening tab extending from said additional spring section, said first fastening tab having a bore therein, and including a deformable lug extending from said coil body through said bore in said first fastening tab.

4,539,540

ELECTROMAGNETIC ROTATING ARMATURE RELAY

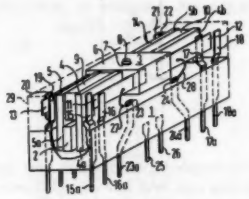
Rolf-Dieter Kimpel, Unterschweinbach; Heinz Stadler, and Alfred Heinzl, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,648

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220985

Int. Cl.³ H01H *50/58*

U.S. Cl. 335—125 **9 Claims**



1. An electromagnetic rotating armature relay with a base body consisting of insulating material carrying an exciting coil, terminal elements being anchored in said base body and an armature being rotatably seated approximately centrally thereon, whereby the armature includes at least one elongated, ferromagnetic bar with opposed lateral sides whose free end forms working air gaps with a spaced pair of pole ends of a coil core and an insulation covering encasing the central area of the armature which contains bearing elements, characterized in that contact springs interacting with cooperating contact elements anchored in the base body are secured in the insulation covering of the armature, said contact springs respectively proceeding parallel to the ferromagnetic bar.

4,539,541

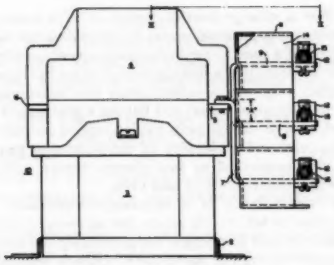
TERMINAL CONNECTOR ASSEMBLY FOR ELECTRIC CONTROL DEVICE

Brit M. Bharteey, Bolingbrook, Ill., and Neal E. Rowe, Asheville, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1983, Ser. No. 544,165

Int. Cl.³ H01H *51/02*

U.S. Cl. 335—132 **5 Claims**



1. An electric control apparatus comprising:

an enclosed control device structure that includes a movable and stationary contact combination;

an electromechanical means integral with and coupled to said control device structure for operating the movable and stationary contact combination between opened and closed positions;

the movable and stationary contact combination having terminal means that extends from said control device; and

a terminal connector assembly comprising an insulating housing having a terminal adapter mounted therein;

said terminal adapter being secured to said terminal means and extending in an outward direction away from said control device and having a terminal lug for securing an incoming electrical conductor to the terminal connector assembly; and

said terminal adapter also being of such configuration that the incoming electrical conductor is attached to the terminal connector assembly at a predetermined location that is laterally offset from the terminal means of the control device.

4,539,542

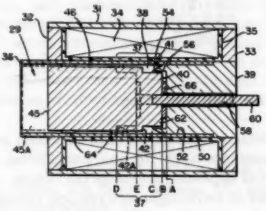
SOLENOID CONSTRUCTION AND METHOD FOR MAKING THE SAME

Bruce D. Clark, Clifton Springs, N.Y., assignor to G. W. Lisk Company, Inc., Clifton Springs, N.Y.

Filed Dec. 23, 1983, Ser. No. 563,891

Int. Cl.³ H01F 7/08

U.S. Cl. 335—261 **29 Claims**



1. An assembly for use in a solenoid comprising:

(a) a hollow solenoid armature tube adapted to be received in a solenoid coil, said tube having an armature chamber therein;

(b) a stationary pole piece member fixed in and defining one end of said armature chamber;

(c) an armature member positioned in said armature chamber of said tube for axial sliding movement relative to and defining an armature stroke relative to said pole piece member;

(d) one of said members having an axially extending recess therein and the other member having a reduced in cross-section end portion adapted to be received in and complimentary to said recess;

(e) said one member having a radially externally facing frusto-conical surface surrounding said recess and extending into said chamber;

(f) said armature tube having a non-magnetic section defining a reduced magnetic gap extending coaxially with at least a portion of said armature stroke sufficient to permit selected magnetic forces to be produced on said armature; and

(g) said armature tube providing concentricity of said two members.

4,539,543

CORE STRUCTURE FOR AN ELECTROMAGNETIC RELAY

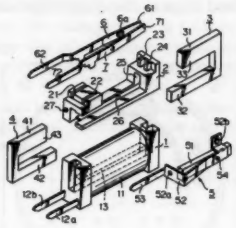
Kunishisa Fujii, Saku; Kosei Yoshino, Komoro, and Masami Nakazawa, Saku, all of Japan, assignors to Takamisawa Electric Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1984, Ser. No. 635,684

Claims priority, application Japan, Jul. 28, 1983, 58-136797

Int. Cl.³ H01F 7/08

U.S. Cl. 335—281 **5 Claims**



1. An electromagnetic relay comprising:

a bobbin having a central hole;

a winding wound on said bobbin;

a base block fixed to said bobbin, said base block having a central hole and at least one guide groove;

a spring type armature means fixed to said base block;

movable contact means fixed to said armature means;

stationary contact spring means secured in said guide groove;

an approximately U-shaped magnetic pole piece having long and short tongues;

an approximately U-shaped magnetic yoke piece having long and short tongues;

the long tongue of said magnetic pole piece and the long tongue of said magnetic yoke piece being opposed and connected to each other at said central hole of said bobbin;

the short tongue of said magnetic pole piece and the short tongue of said magnetic yoke piece being opposed without contact to each other at said central hole of said base block; and

said armature means locating in the vicinity of a gap between the short tongues of said magnetic pole piece and said magnetic yoke piece.

4,539,544

DETENT MECHANISM FOR A HAND-OPERATED TRANSDUCER

Werner Rapp, Geislingen, Fed. Rep. of Germany, assignor to Starkstrom-Apparatebau GmbH, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 494,054

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224386

Int. Cl.³ H01F 7/02

U.S. Cl. 335—296 **6 Claims**

1. A detent mechanism for a manually activated transducer, particularly an angular distance transducer, in which the transducer element is movable along a predetermined path by means of a handle and which includes a sensor for scanning markings on the transducer element, said detent mechanism comprising:

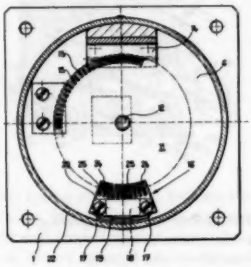
fixed first magnetic means including at least one permanent magnet with two pole shoes which form an air gap between them;

second magnetic means spaced apart from and being movable with respect to said fixed first magnetic means for cooperating therewith such that said transducer element can be located by magnetic force in one of a plurality of definite positions;

said second magnetic means is a rotatably mounted disc of a magnetizable material, the edge zone of which, like the portion of the two pole shoes overlapping said edge zone, has a plurality of grooves and teeth of the same size and angular displacement, running radially with respect to the rotational axis of the disc;

at least one air gap formed between said first and second magnetic means across which said magnetic means cooperate with each other without physically contacting each other;

said first and second magnetic means being constructed of a predetermined shape so that the configuration of the magnetic field in the air gap is such that a smaller effective air gap is created when said first and second magnetic means correspond to said one of a plurality of definite positions of the transducer element than when in other positions and the first and second magnetic means which determine the magnetic field in the air gap include adjacent, spaced grooves spaced in the direction of movement of the second magnetic means; and



all of said grooves have the same width and the teeth formed between two adjacent grooves also have the same width, measured respectively in the direction of movement of the second magnetic means.

4,539,545

THERMAL SWITCH

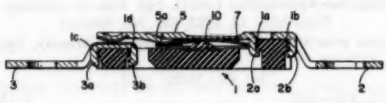
Willi Klotz, Unterreichenbach, Fed. Rep. of Germany, assignor to Microtherm GmbH, Pforzheim, Fed. Rep. of Germany

Filed May 25, 1984, Ser. No. 614,457

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319227

Int. Cl.³ H01H *37/04, 37/52*

U.S. Cl. 337—380 **4 Claims**



1. In a thermal switch for temperature control of electrical heating apparatus, comprising a contact reed having a stationary end and a free end, said stationary end being mounted on a suport structure in electrically conductive relation to a terminal, a contact opposite said free end mounted on said support structure, said stationary end and said contact being electrically insulated from each other, and a bimetallic disk spring located intermediate the ends of said contact reed in such manner as to lift said free end off said opposite contact when said disk spring reverts upon reaching a maximum permissible temperature, said contact reed being rigid with the exception of a relatively short longitudinal section acting in the manner of a hinge when subjected to elastic bending stress, the improvement wherein said contact reed and terminal are integral and have the same thickness except for said longitudinal section, said opposite contact and said free end facing said contact are fashioned as one of an inlay and toplay contact, claw-shaped fasteners are formed out of said terminal which fit around a projection on said support structure, and wherein a second terminal is provided having claw-shaped fasteners formed therefrom which are secured to said support structure remote from said first-mentioned terminal.

4,539,546

SLIDING RHEOSTAT WITH SLIDER ELEMENT HAVING CALIBRATION MEANS

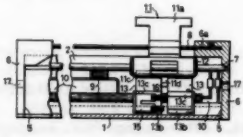
Keiji Takezawa, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

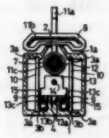
Filed Apr. 30, 1984, Ser. No. 605,597

Claims priority, application Japan, Apr. 28, 1983, 58-63092[U]

Int. Cl.³ H01C *10/38, 10/16, 10/00*

U.S. Cl. 338—176 **6 Claims**





1. A sliding rheostat comprising:

a casing,

a pair of resistance base plates each of which carries a respective resistance layer, the base plates being disposed in a parallel and opposed relation in the casing,

sliders adapted to be brought into resilient contact with the respective base plates,

two slider supports disposed between the base plates and adapted to be slid therealong, the sliders being mounted on the opposite surfaces of the slider supports,

a support body for holding the slider supports, and

adjusting means disposed between at least one of the slider supports and the support body for adjusting the positions of the sliders relative to the support body to align the sliders.

4,539,547

LOW LIQUID LEVEL SENSING AND WARNING CIRCUIT

George Nagy, Jr., Canton, and Clement W. Rowan, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 25, 1983, Ser. No. 488,465

Int. Cl.³ B60Q *1/00*

U.S. Cl. 340—59 **4 Claims**

3. A low liquid level sensor circuit for use in combination with

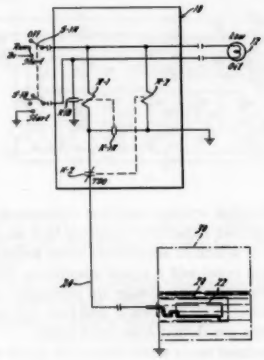
a source of electrical potential;

switch means between said circuit and said electrical potential source for providing application of said electrical potential to said circuit; and

an electrical switch type liquid level sensor mounted in a

liquid container and connected to said circuit to open an electrical ground path when sensed liquid surrounding said sensor is above a predetermined level and to close an electrical ground path when said liquid is below said predetermined level; said circuit comprises:

timing means connected between said switch means and ground for disconnecting said sensor from said circuit after a predetermined period of time following the application of said potential to said circuit by said switch means;



warning means connected to said switch means for providing a humanly perceivable warning when said sensor provides a closed ground path during said predetermined period of time; and

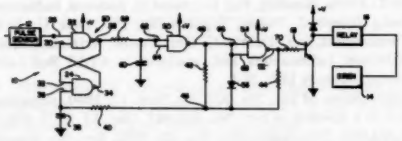
means connected between said switch means and said sensor during said predetermined period of time for closing a separate ground path to said warning means in the event said sensor provides a closed ground path during said predetermined period of time and in such event, holding said separate ground path closed until said switch means ceases application of said electrical potential.

4,539,548

VEHICLE ALARM APPARATUS

Allan B. Crites, Elk Grove Village, Ill., assignor to David F. Arlasky, Northbrook, Ill.

Filed Jul. 19, 1982, Ser. No. 399,727
Int. Cl.³ B60R *25/10*
U.S. Cl. 340—63 **10 Claims**



1. In a vehicle alarm system sensing unauthorized use and providing a warning thereof, including a warning device, means for actuating said warning device, and timing means including a resistor/capacitor charge-discharge circuit providing a first predetermined time interval during which actuation of said warning device is inhibited to permit an authorized user to exit said vehicle without actuating said warning device and a second predetermined time interval during which actuation of said warning device is enabled in response to sensing of unauthorized use of said vehicle, wherein the improvement comprises:

voltage divider means including a pair of resistors connected at one terminal end to said resistor/capacitor charge-discharge circuit and defining respective legs of said voltage divider means at the respective other terminal ends of said resistors; and

switching means coupled to said respective other terminal ends of said resistors, including means for selectively providing a reference high voltage level to one resistor and a reference low voltage level to the other resistor during a charging time of said resistor/capacitor charge-discharge circuit corresponding to said first predetermined time interval, and means responsive to sensing of unauthorized use of said vehicle to thereafter provide said reference high voltage level to said other resistor and said reference low voltage level to said one resistor during a discharge time of said resistor/capacitor charge-discharge circuit corresponding to said second predetermined time interval;

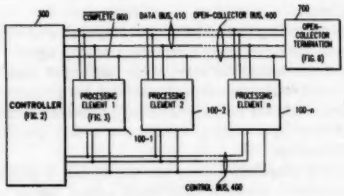
whereby said second predetermined time interval is substantially increased with respect to said first predetermined time interval.

4,539,549

METHOD AND APPARATUS FOR DETERMINING MINIMUM/MAXIMUM OF MULTIPLE DATA WORDS

Se J. Hong, Yorktown Heights, and Ravindra Nair, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,813
Int. Cl.³ G06F *7/02*
U.S. Cl. 340—146.2 **21 Claims**



SYSTEM BLOCK DIAGRAM

1. A method for determining a minimum/maximum among a plurality of data words, comprising the steps of:

(a) storing each of said data words in a corresponding processing element;

(b) outputting from each of said processing elements a first multi-bit signal having a predetermined bit state only in a position corresponding to the position of the highest order non-zero bit of the data word stored in the processing element;

(c) eliminating from said second multi-bit signal said predetermined bit state in all positions except for a lowest order position in said predetermined bit state to provide a third multi-bit signal;

(e) deactivating ones of said processing elements having a data word having a non-zero bit in a higher position than said lowest order position in said third multi-bit signal;

(f) in each processing element not deactivated, eliminating any non-zero bit from said data word in the same position as said lowest order position in said third multi-bit signal; and

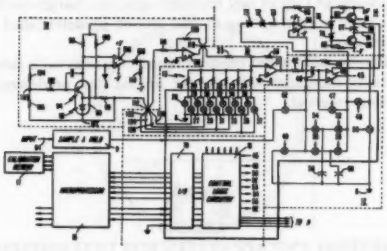
(g) repeating, with respect to each processing element not deactivated, said steps (b) to (f) until only a single processing element or plural processing elements in which are stored the same data word remain active.

4,539,550

ANALOG TO DIGITAL CONVERTER USING RECIRCULATION OF REMAINDER

Benjamin Eng, Jr., Everett; John M. Anholm, Jr., Snohomish, and Peter S. Duryee, Lynnwood, all of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Nov. 14, 1983, Ser. No. 551,712
Int. Cl.[3] G08C 9/00
U.S. Cl. 340—347 AD 5 Claims



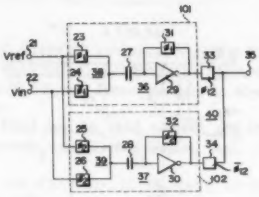
1. An analog to digital converter circuit, comprising:
input means for receiving an input analog signal;
controlled switch means for developing a reference digital signal;
digital to analog converter means responsive to said switch means for developing a reference analog signal;
comparator means for comparing said input analog signal and said reference analog signal and for generating a first signal when the magnitudes of said reference analog signal and said input analog signal have a first predetermined relationship;
difference amplifier means for amplifying a difference in magnitudes between said input analog signal and said reference analog signal to develop a remainder signal;
means for storing the analog remainder signal;
said comparator means including means for comparing said remainder analog signal and said reference analog signal and for generating the first signal when the magnitudes of the remainder analog signal and the reference analog signal have a second predetermined relationship;
control means for successively operating said switch means until said first signal is generated by said comparator means and, thereafter, for terminating generation of said first signal by said comparator means; and
means for providing a digital signal indicative of said switch means upon said terminating of said first signal and of a portion of said remainder signal which together represent said input analog signal;
wherein said digital to analog converter comprises a series of resistors having progressive resistance values, respectively, one end of each of said resistors being connected to a first polarity voltage source, and said switch means includes a pair of controlled switches at the opposite end of each of said resistors, alternate ones of each said pair of switch means being connected respectively to an opposite polarity voltage source and a ground, said control means alternatively closing one or the other of said each pair of controlled switches, thereby establishing unidirectional current flow through said switches.

4,539,551

DIFFERENTIAL VOLTAGE AMPLIFIER

Yasuhiko Fujita, Tokyo, and Eiji Masuda, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 29, 1983, Ser. No. 518,443
Claims priority, application Japan, Jul. 30, 1982, 57-133560; Dec. 7, 1982, 57-214335
Int. Cl.[3] H03K 13/02, 3/023
U.S. Cl. 340—347 AD 8 Claims



1. A differential voltage amplifier comprising:
first and second capacitive coupling type amplifying means in each of which an autozeroed mode period for setting an operating point and a signal amplifying mode period for amplifying an input voltage are alternately set up, and the autozeroed mode periods in said first and second amplifying means are shifted from each other;
first and second mode select means for alternately setting up the autozeroed mode and the signal amplifying mode in said first and second capacitive coupling type amplifying means;
first and second signal selecting means provided corresponding to said first and second capacitive coupling type amplifying means, said first and second signal selecting means alternately selecting a reference voltage and an input signal voltage to apply the selected signal to said first and second capacitive coupling type amplifying means, said first and second signal selecting means selecting the reference voltage corresponding to the autozeroed mode periods of said first and second capacitive coupling type amplifying means and the input signal voltage corresponding to the signal amplifying mode periods; and
means for selecting the amplified signal output from said first and second capacitive coupling type amplifying means when said first and second capacitive coupling type amplifying means are in the signal amplifying mode.

4,539,552

DIGITAL-TO-ANALOG CONVERTER

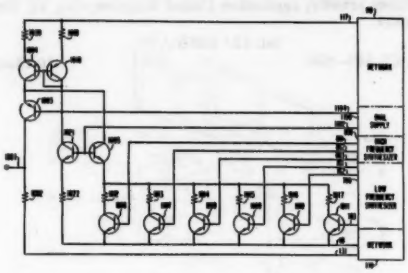
Paul C. Davis, Reading, Pa.; Raymond G. Jackson, Indianapolis, Ind.; Joseph J. Nahas, Wyomissing, Pa.; Dale H. Nelson, Cumberland, Ind.; DeWitt G. Ong, Tempe, Ariz., and Brian A. Wittman, Indianapolis, Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 207,750, Nov. 17, 1980, abandoned, which is a division of Ser. No. 103,403, Dec. 13, 1979, Pat. No. 4,352,958. This application Sep. 10, 1982, Ser. No. 416,609
Int. Cl.[3] H03K 13/02
U.S. Cl. 340—347 DA 6 Claims

1. A digital-to-analog converter comprising input circuit connections (**861**, **862**, **761**, **762**) for receiving a plurality of binary input signals, and means responsive to the binary input signals for producing an analog output signal at an output circuit connection (**1001**), the magnitude of the analog output signal being representative of the binary input signals, characterized in that:
the converter includes a constant current generator (**1004**, **1018–1022**) connected to a power source, the constant current generator comprising a current mirror with a first transistor (**1018**) and a second transistor (**1004**) and

wherein a fixed constant current in the first transistor is repeated in the second transistor;

the means for producing the analog output signal is comprised of means for subtracting a source current reflective of the binary input signals from the current in the second



transistor at a first current summer (**1003**), the amount subtracted being determined by the received binary input signals; and

the converter provides a constant total current demand from the power source while receiving any one or combination of the plurality of binary input signals.

4,539,553

DIGITAL-TO-ANALOG CONVERTER OF THE CURRENT-ADDING TYPE

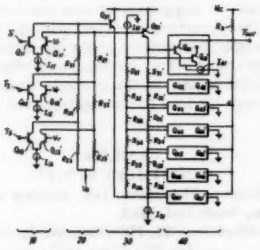
Masashi Takeda, and Masaru Iwasa, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1983, Ser. No. 480,078

Claims priority, application Japan, Mar. 30, 1982, 57-50183; Apr. 16, 1982, 57-62515

Int. Cl.³ H03K *13/05*

U.S. Cl. 340—347 DA **31 Claims**



1. Apparatus for converting an n-bit digital signal to an analog signal having a level corresponding to the numerical value of said n-bit digital signal, comprising:

a buffer circuit for receiving the bits of said n-bit digital signal in parallel and for producing buffered digital signals therefrom;

first voltage divider means receiving said buffered digital signals and producing a pair of output signals having voltage levels related to the numerical value of said n-bit digital signal;

second voltage divider means receiving said pair of output signals from said first voltage divider means and having a plurality of voltage dividing nodes, the voltages at said nodes representing outputs of said second voltage divider means;

a plurality of voltage comparator means, each connected to receive a pair of voltages from said voltage dividing nodes of said second voltage divider means for generating output signals based upon the comparison; and

output means receiving said output signals from said plurality of comparator means and forming said analog signal therefrom.

4,539,554

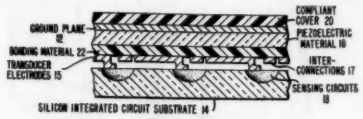
ANALOG INTEGRATED CIRCUIT PRESSURE SENSOR

John F. Jarvis, Fair Haven; Robert G. Swartz, Highlands, and Bruce A. Wooley, Tinton Falls, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 18, 1982, Ser. No. 434,876

Int. Cl.³ G06F *3/02;* **H01L** *41/08*

U.S. Cl. 345—365 A **5 Claims**



1. An analog integrated circuit pressure sensor comprising

a pressure sensitive piezoelectric material layer (**10**) having a substantially parallel top and bottom surfaces;

a silicon substrate layer (**14**) disposed underneath the bottom surface of said pressure sensitive piezoelectric material and including a plurality of individual electrodes (**15**) formed on the surface thereof and in direct contact with said bottom surface of said piezoelectric material;

a ground plane layer (**12**) disposed directly in contact with the top surface of said piezoelectric material, the combination of said ground plane layer, said piezoelectric material layer, and said plurality of individual electrodes being defined as a plurality of capacitive transducing elements (**16**); and

a layer of compliant material (**20**) disposed to cover the major exposed surface of said ground plane layer and capable of being locally displaced towards said silicon substrate by a locally applied pressure, said locally applied pressure inducing a charge on a capacitive transducing element of said plurality of transducing elements located in the region of said applied force for producing as an output of said pressure sensor an analog voltage signal proportional to the force of the locally applied pressure.

4,539,555

FIRE AND SMOKE PROTECTION DEVICE FOR USE IN BUILDINGS

Edward E. Tefka, 2135 Southgate, Northfield, Ill. 60093

Continuation of Ser. No. 448,096, Dec. 9, 1982, abandoned, which is a continuation of Ser. No. 216,861, Dec. 16, 1980, abandoned. This application Jul. 6, 1984, Ser. No. 628,459

Int. Cl.³ G08B *23/00;* **E05B** *45/06*

U.S. Cl. 340—500 **10 Claims**

1. For use with a hotel-like security system in which a normally closed, but manually physically movable, framed door blocks free access between a corridor area and a stairwell area of a hotel or other building, the improvement of an anti-security control that is to be activated only under smoke and/or fire conditions, comprising, in combination:

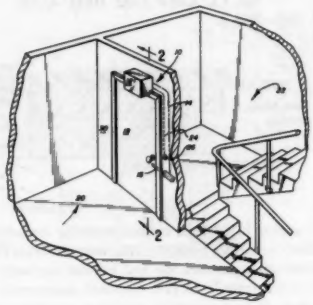
movable bolt means positioned for normally securing the door in a closed, locked position within its frame, to prevent any manual movement of the door that could provide selective access between the stairwell and corridor in the absence of a smoke and/or fire condition, said bolt means including biasing means for normally biasing said bolt means into a locked position;

means for supplying electric power to the anti-sercurity control;

detector means responsive to smoke and/or fire conditions sensed in either of the two said areas separated by the closed door, said detector means being operatively connected to said power means and including gating means for gating power when smoke and/or fire conditions are sensed;

signal means for providing an alerting audible signal when smoke and/or fire conditions are sensed, said signal means being operatively connected to said gating means; and

release means for automatically moving said bolt means against said biasing means to release the door from its



normally locked condition, without opening the door when a dangerous smoke and/or fire condition is sensed by said detector means, said release means being operatively connected to said gating means, whereby, when the detector means senses a dangerous smoke and/or fire condition, said gating means shunts power to energize both said signal means and said release means to thereby provide an audible alerting signal and also permitting selective manual opening movement of the door, to permit selective access by a person between the corridor and the stairwell side of the hotel, or other hotel-like building.

4,539,556

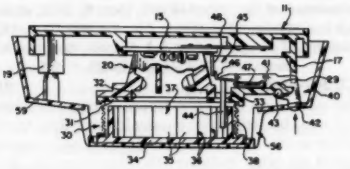
COMBUSTION PRODUCTS DETECTOR WITH ACCELERATED TEST

Stanley S. Dederich, Naperville; George A. Schoenfelder, Downers Grove, and William M. Koster, Bartlett, all of Ill., assignors to Pittway Corporation, Aurora, Ill.

Filed Apr. 15, 1983, Ser. No. 485,234

Int. Cl.³ G08B *29/00, 17/10*

U.S. Cl. 340—515 **20 Claims**



1. In a combustion products detector including combustion products sensing means, alarm means responsive to the sensing of combustion products by the sensing means, control means for periodically enabling the sensing means and test means selectively operable for simulating the presence of combustion products, the improvement comprising: frequency change means coupled to the control means and responsive to operation of the test means for changing the frequency of enablement of the sensing means.

4,539,557

COMBINED COMMUNICATION, SECURITY AND ALARM RADIO SYSTEM

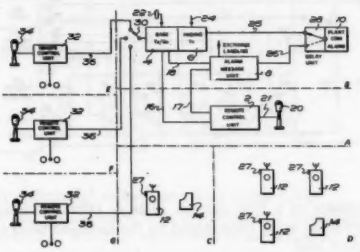
Norman L. Redshaw, Whitley Bay, England, assignor to Sunderland & South Shields Water Company, Sunderland, England

Filed Oct. 15, 1982, Ser. No. 434,705

Claims priority, application United Kingdom, Oct. 19, 1981, 8131499

Int. Cl.³ G08B *1/08*

U.S. Cl. 340—539 **10 Claims**



1. A combined communication, security and alarm radio system for supervising equipment in a plant or installation, said system including:

(a) a remote control unit;

(b) a base transmitter/receiver in two way voice communication with the remote control unit;

(c) a plurality of portable transmitter/receiver units tuned to the frequency of the base transmitter/receiver to enable direct voice communication between operators through the base transmitter/receiver;

(d) an alarm message unit connected to the remote control unit and also to a telephone exchange landline, for sending out pre-recorded alarm messages in sequence to a plurality of subscribers; and

(e) manually operable means on each portable transmitter/-receiver unit for triggering the base transmitter/receiver to activate the alarm message unit, said alarm message unit simultaneously transmitting to the subscribers in sequence the pre-recorded alarm message over the telephone exchange landline and to the portable transmitter/receiver units through the base transmitter/receiver.

4,539,558

ANTITHEFT SYSTEM

Edward R. Fearon, Richardson, Tex., assignor to Shin International, Inc., Southfield, Mich.

Filed Nov. 24, 1981, Ser. No. 323,593

Int. Cl.³ G08B *13/24*

U.S. Cl. 340—572 **12 Claims**

1. An antitheft system comprising:

a magnetic marker,

means for generating an oscillating electromagnetic field within a surveillance zone so that said marker, when positioned within said zone, cuts or links lines of magnetic flux regardless of the orientation of said marker,

means for receiving an electromagnetic signal from said surveillance zone and for generating an output signal representative thereof,

means for processing said output signal to determine the presence of said marker within said surveillance zone,

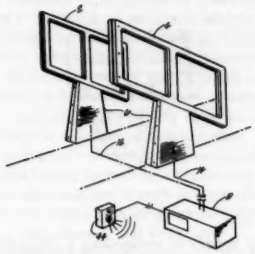
means responsive to said processing means for indicating the presence of the marker within the surveillance zone

wherein said generating means generates an oscillating field within the surveillance zone at a substantially constant frequency f_1, said marker being constructed of a material which is exerted by an oscillating electromagnetic field having a frequency of f_1 and which generates a wide range

of harmonics, and wherein said processing means comprises:

first means for determining the electromagnetic field in the surveillance zone between frequencies f_2 and f_3,

means responsive to said determining means for projecting the electromagnetic field between frequencies f_4 and f_5;



second means for determining the electromagnetic field in the surveillance zone between frequencies f_4 and f_5; and

means providing an output signal to said indicating means when the output from said second determining means exceeds the output from the projecting means;

where $f_1 < f_2 < f_3 < f_4 < f_5$.

4,539,559

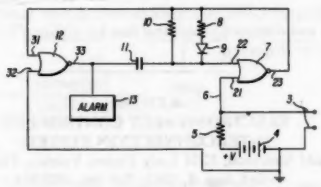
PORTABLE, DISPOSABLE WARNING DEVICE FOR DETECTING URINE-WET UNDERGARMENTS

Hugh Kelly, 737 Point Rd., Little Silver, N.J. 07739, and Alvin Krass, 205 Holland Rd., Holmdel, N.J. 07701

Filed Mar. 29, 1982, Ser. No. 363,049

Int. Cl.³ G08B 21/00

U.S. Cl. 340—573 **7 Claims**



1. A portable electronic device with a disposable sensor for producing a signal when an undergarment is wet with urine, which comprises, in combination

(a) a sensor circuit comprising

(i) separated electric terminals mounted to facilitate contact with said undergarment,

(ii) conducting leads connected to said terminals,

(iii) said leads being connected together through a voltage source and a resistance means,

(iv) said resistance means having a resistance value at least ten times the resistance to be expected between said terminals when in contact with said urine-wet undergarment,

(v) the voltage from said voltage source and the resistance in said resistance means being chosen such that, in combination with the resistance between said terminals, no more than 10 microamperes of current can flow in said sensor circuit;

(b) an oscillating means connected to said sensor circuit in such manner that said oscillating means oscillates only when current passes in said sensor circuit, and

(c) an indicating means connected through an inverting means to said oscillating means.

4,539,560

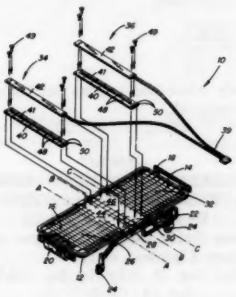
BED DEPARTURE DETECTION SYSTEM

David C. Fleck; Joseph H. Novak, and Clement J. Koerber, Sr., all of Batesville, Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Dec. 10, 1982, Ser. No. 448,827

Int. Cl.³ G08B 21/00

U.S. Cl. 340—573 **24 Claims**



1. Detection apparatus for an articulated bed having at least two articulated sections for supporting a mattress, each section including a rigid frame, comprising:

a first tape switch attached to a thigh supporting section of the bed and suspended from the frame across the width of the bed underneath of and in contact with the mattress;

a second tape switch attached to a seat supporting section of the bed and suspended from the frame across the width of the bed underneath of and in contact with the mattress;

said tape switches being separately actuable by the weight of a person on the respective sections of the bed to which the switches are attached; and

said tape switches being electrically connected and adapted to cooperate with an external electrical circuit for producing a signal in response to the person's weight shifting off of the sections to which the switches are attached.

4,539,561

PROCESS AND DEVICE FOR INSPECTING THE SURFACE OF A MATERIAL

Gunther Wulff, Stein am Rhein, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 4, 1983, Ser. No. 464,049

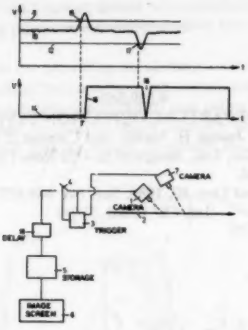
Claims priority, application Switzerland, Feb. 15, 1982, 924/82

Int. Cl.³ G08B 21/00

U.S. Cl. 340—675 **15 Claims**

1. Process for inspection of the surface of a material by visual examination of a television picture produced by at least one camera focused on the material surface and displaying the resultant image obtained on a monitor or screen, which comprises: providing the surface of a material to be inspected, providing a camera focused on said surface operative to detect

defects on said surface and a screen operatively connected to said camera, providing means for displaying said surface on



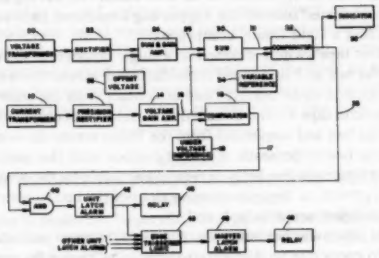
said screen only when said camera detects a defect on the surface of the material.

4,539,562

LOAD CURRENT MONITORING DEVICE FOR DETECTING PREDETERMINED DEGREE OF CHANGE IN LOAD IMPEDANCE

Gary G. Sanders, Lakewood, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Dec. 30, 1982, Ser. No. 454,716
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—657 **10 Claims**



1. A device for detecting changes in load impedance by detecting changes in load current that are not induced by fluctuations in the applied load voltage comprising:

means for monitoring the current provided to the load, said current monitoring means providing a dc voltage signal having an amplitude proportional to the amount of load current;

means for monitoring the voltage applied to the load, said voltage monitoring means providing another dc voltage signal having an amplitude proportional to the amount of load voltage; and

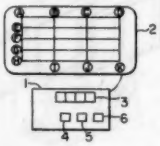
means responsive to said dc signals, said responsive means comparing a value indicative of the monitored current to a preset reference value, the said value indicative of the monitored current being corrected prior to said comparing by means of a correction signal derived from the monitored voltage to negate the effect on the value indicative of monitored current of fluctuations in the load voltage, the said responsive means indicating a predetermined change in load current relative to said reference value resulting solely from a predetermined change in load impedance.

4,539,563

METHOD AND APPARATUS FOR DRAWING LINES

Kazuaki Sako, Ibaraki, and Kenjiro Mori, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,589
Claims priority, application Japan, May 11, 1981, 56-69445
Int. Cl.³ G09G *1/00*
U.S. Cl. 340—735 **7 Claims**



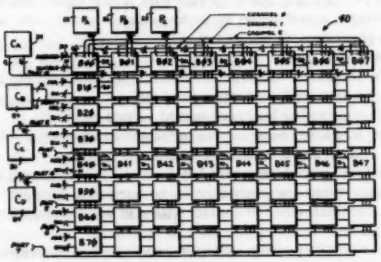
1. A display apparatus comprising a display screen; input means for entering positional information for the starting point of a line to be displayed on said display screen; memory means for storing displayed-line information of lines which have been displayed on the display screen by scanning in a first directional including location of the starting and ending points of lines which have been displayed on said display screen; and processing means including means for determining the location of the ending point of the line to be displayed by scanning in a second direction orthogonal to the first direction in accordance with said positional information entered from said input means and said displayed-line information stored in said memory means, means for generating new line information based on said determination, means for controlling said new line information in said memory means as a part of said displayed-line information in said memory means, and means for causing said display means to display a line on said display screen in accordance with said new line information by scanning in said second direction, said processing means repeating said determination of location of ending point of the line to be displayed, generating new line information, storing new generated information and displaying said new line information for additional lines to be displayed.

4,539,564

ELECTRONICALLY CONTROLLED INTERCONNECTION SYSTEM

G. Ronald Smithson, 1204 Lady Elaine, Valrico, Fla. 33594

Filed Aug. 4, 1982, Ser. No. 405,301
Int. Cl.³ H04Q *9/00*
U.S. Cl. 340—825.79 **13 Claims**



1. A four-wire duplex interconnection system for selectively connecting M pairs of digital data sources and sinks simultaneously to N pairs of digital data sources and sinks in which said digital data is composed of parallel bytes of X digital bits comprising:

an interconnection matrix having M rows and X columns,

each of said M rows serving as an input port for one of said M pairs of data sources and sinks;

a plurality of analog switches, a pair of said switches disposed at each intersection of said rows and columns, each of said switches having a common input and X poles, and a digital address input for receiving a different digital address associated with each of said poles, said poles having a common input selectably connectable to one of said poles in response to its digital address, each of said common inputs serving as an input port for one of said X bits from or to a source or sink connected to said port wherein respective ones of said X poles of each pair of said switches in one of said rows are connected in parallel with the respective ones of said X poles of each pair of said switches in all other of said columns;

X output busses, each of said busses having 2X conductors, each of said busses formed by a conductor from one pole of each of said switches in each column of said paralleled switches, said busses providing output connections to said N pairs of data sources and sinks; and

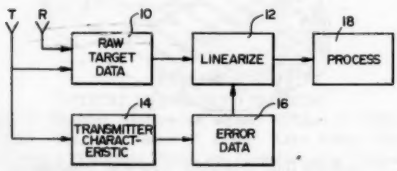
channel selection means for generating X addresses indicative of each of said X output busses, said channel selection means having a separately controllable address output connected to each of said rows of said switches whereby said M pairs of sources and sinks are connectable, selectively to said N pairs of data sources and sinks.

4,539,565

FM/CW RADAR LINEARIZATION NETWORK AND METHOD THEREFOR

Keith H. Norsworthy, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 16, 1982, Ser. No. 408,251
Int. Cl.³ G01S *13/32, 7/40*
U.S. Cl. 343—14 **50 Claims**



1. An FM/CW radar linearization network compensating for random variations in the linearity of the frequency sweep of the radar transmitter in the processing of the radar receiver signal characteristic of the range and physical size of a target to provide target identification data discriminating said target from background reflections, said network comprising:

a. raw target data generating means for developing a target data signal containing frequency un-normalized target identification information, wherein the instantaneous frequency of said target data signal is characteristic of the range of a target and the amplitude of said target data signal is characteristic of the size of said target at that range;

b. transmitter characteristic data generating means for developing a sampling signal containing transmitter frequency sweep information;

c. error data generating means receiving said sampling signal for developing an error signal characteristic of any nonlinearity in the sweep of the transmitter frequency; and,

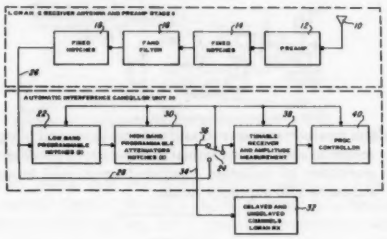
d. linearization means receiving said raw target data signal and said error signal for frequency normalizing target identification information by compensation for any random variation in the linearity of the sweep of transmitter frequency.

4,539,566

AUTOMATIC INTERFERENCE CANCELING APPARATUS

Claude A. Sharpe, Plano, and Cecil C. Ho, Irving, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 4, 1982, Ser. No. 439,096
Int. Cl.³ G01S *1/24*
U.S. Cl. 343—389 **9 Claims**



1. An automatic interference canceling device comprising:

a. a RF signal receiver means for receiving RF energy signals;

b. a programmable notch filter means operatively connected to the RF signal receiver for attenuating a preselected number of interferers in the RF signal band;

c. a tuneable receiver and amplitude measuring means for scanning the band and determining the presence of interferers and their amplitudes;

d. an automatic gain control means connected to the tuneable receiver and amplitude measuring means for determining the amplitude of the interferer over a very wide dynamic range;

e. a multiple switch selectively interconnecting the RF signal receiver means, programmable filter means and tuneable receiver and amplitude measuring means; and

f. a controller connected to the tuneable receiver and amplitude measuring device, multiple switch and programmable filter means for controlling their operation by selectively activating the switch to connect the tuneable receiver and amplitude measuring device to the RF signal receiver for scanning the band of operation by stepping through a preselected number of frequency increments of the band for determining any interferer present including its amplitude and outputting the information through the automatic gain control means to the controller for storage and determination of a preselected number of worst interferers; and switching in the programmable filter means for filtering these interferers from the RF signals utilizing the gain control level as an indication of relative amplitudes to control the tuning process.

4,539,567

MICROWAVE MONITOR

Richard D. Brewer, Corona Del Mar, Calif., assignor to Micrometrics, Ltd., Irvine, Calif.

Filed Sep. 12, 1983, Ser. No. 531,260
Int. Cl.³ G01S *3/02*
U.S. Cl. 343—351 **12 Claims**

1. An improved microwave field monitoring device comprising:

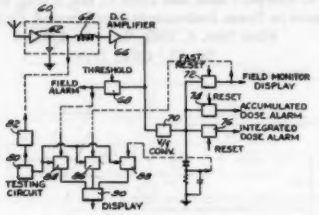
a housing adapted to be worn upon an individual;

antenna means carried by said housing for detecting microwave radiation irradiated upon said housing at a specific microwave radiation band level;

means responsive to said antenna means for accumulating and integrating the amount of radiation irradiated upon said housing over differing predetermined time periods;

means for displaying the accumulated and integrated amount

of radiation irradiated upon said housing for each of said differing time periods; and



alarm means responsive to said accumulating and integrating means to alert the individual to exposure of predetermined quantities of radiation irradiated upon said housing in excess of safe exposure limits.

4,539,568

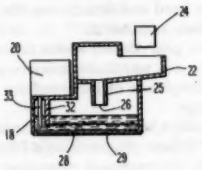
HOT MELT INK JET HAVING NON-SPILL RESERVOIR

Arthur M. Lewis, and Aldo Scudo, both of Ridgefield, Conn., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 15, 1984, Ser. No. 660,539

Int. Cl.[3] G01D *15/18*

U.S. Cl. 346—1.1 **10 Claims**



1. An ink jet apparatus utilizing hot melt ink, comprising a printing head, a heat conductive reservoir for holding a supply of ink, heating means in thermal connection with said reservoir for heating said supply of ink to maintain it in a melted phase, and outlet means for providing an outlet feed of said melted ink to said printing head, characterized by said reservoir having a normally open port with a port face in the interior of said reservoir, said port face being positioned at substantially the volumetric center of said reservoir.

4,539,569

INK JET RECORDING APPARATUS

Takashi Watanabe, Hiratsuka; Masakazu Ozawa, Atsugi; Yutaka Koizumi, Hiratsuka, and Haruyuki Matsumoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1983, Ser. No. 543,929

Claims priority, application Japan, Oct. 26, 1982, 57-161062[U]; Oct. 26, 1982, 57-161063[U]

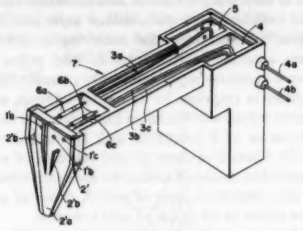
Int. Cl.[3] G01D *15/18*

U.S. Cl. 346—140 R **7 Claims**

1. An ink jet recording apparatus comprising:

a recording head having a plurality of outlet ports for ejecting ink; and

head plate means having a plurality of openings corresponding with said plurality of outlet ports for ejection of ink through said openings, guide groove means formed by walls on said head plate means for defining a flow path to a discharge port for residual ink flowing from said openings and at least one partition plate disposed on said head plate means to divide said openings into at least two groups for substantially preventing residual ink from an opening of one said group from mixing with residual ink from an opening of another said



group, wherein said partition plate is spaced apart from and located non-contiguous with said openings.

4,539,570

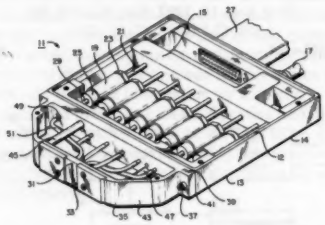
STACKABLE FLUID DISPENSING APPARATUS

Eugene W. Moore, Hurst, Tex., assignor to Willett International Limited, Slough, England

Filed Dec. 9, 1983, Ser. No. 559,752

Int. Cl.[3] G01D *15/18*

U.S. Cl. 346—75 **10 Claims**



1. A stackable fluid dispensing apparatus, comprising:

a case;

a fluid manifold located within said case and adapted to be connected to a source of pressurized fluid;

a plurality of valves located within said case, each of said valves connected to said fluid manifold by a fluid line;

a nozzle block on said case, said nozzle block having a plurality of fluid dispensing openings positioned within an exterior face of said nozzle block in at least one line;

fluid passage means communicating each of said valves with a selected one of said nozzle block openings whereby actuation of said valves controls the flow of fluid through said nozzle block openings;

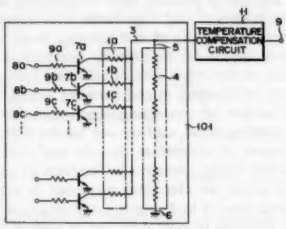
electrical control means for controlling the actuation of said valves; and

wherein the dispensing openings at the outermost extents of said line in said nozzle block are located adjacent opposite edges of said exterior face, the distance from the center of each of said opposite outermost dispensing openings to the respective adjacent edge of said exterior face being one half the center to center distance of any two remaining dispensing openings in said line and wherein said nozzle block is carried in a removable front end mounted on said case to allow alternate nozzle blocks to be mounted on said case, said alternate nozzle blocks having different dispensing opening spacing.

4,539,571
THERMAL PRINTING SYSTEM

Kuniaki Suzuki, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 9, 1983, Ser. No. 530,674
Claims priority, application Japan, Sep. 14, 1982, 57-158872
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH 9 Claims

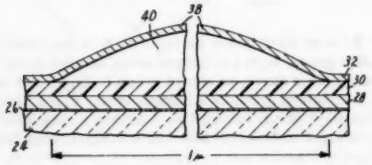


1. A thermal printing head apparatus comprising:
a radiating substrate;
a plurality of main heating elements arranged in a line, provided on a surface of said radiating substrate;
an auxiliary heating element mounted on a surface of said radiating substrate near said main housing means; and
controllable driving means for driving said auxiliary heating means to heat said main heating elements to a temperature below a dot print feasible temperature, and for independently driving selected ones of said main heating elements to said dot feasible temperature so as to print a given pattern.

4,539,572
OPTICAL RECORDING MEDIUM

William B. Robbins, Maplewood, Minn.; Richard F. Willson, Hudson, Wis., and Robert P. Freese, Lake Elmo, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 234,111, Feb. 13, 1981, Pat. No. 4,430,659. This application Feb. 15, 1983, Ser. No. 466,436
Int. Cl.³ G01D *15/34*
U.S. Cl. 346—135.1 19 Claims

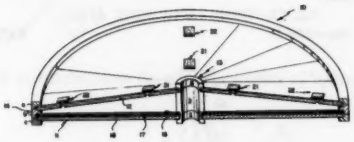


1. An optical recording medium comprising a substrate and a light-absorbing layer having a thickness in the range of 1–60 nm in which information is recordable in the form of discrete features creatable by a focused, modulated laser-beam, wherein the improvement comprises:
said light-absorbing layer comprising a refractory material formed of carbides of aluminum, hafnium, niobium, tantalum, titanium, vanadium, tungsten and zirconium and alloys therebetween.

4,539,573
PROTECTIVE CONSTRUCTION FOR OPTICAL DISK UNITS

Alan B. Marchant, Rochester, and Dennis G. Howe, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1983, Ser. No. 507,447
Int. Cl.³ G01D *15/32*; G11B *5/52*
U.S. Cl. 346—137 16 Claims

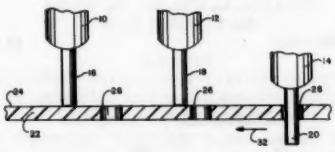


1. In an optical disc unit of the kind including: (a) a disk-shaped record element, having a record portion; (b) a flexible cover sheet which opposes and is generally coextensive with record portion and (c) outer spacing means which couples outer peripheral portions of said record element and cover sheet in a manner which generally encloses the space therebetween and defines an outer sheet-to-element spacing, the improvement comprising:
(1) inner spacing means which cooperate with radially inner portions of said record element and said cover sheet to define an inner sheet-to-element spacing that is predeterminedly greater than said outer spacing; and
(2) radially inner and outer vent means for allowing a continuous air flow into and out of the space between said record element and said cover sheet during disk unit rotation, said vent means being constructed to cause said cover sheet to flex to a position in which it is closely spaced from and generally parallel to said record portion.

4,539,574
PEN CAPPING MECHANISM

Lloyd N. Broome, Fullerton, and James Lawrence, Irvine, both of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 4, 1983, Ser. No. 538,863
Int. Cl.³ G01D *15/16*, *15/18*
U.S. Cl. 346—139 R 16 Claims

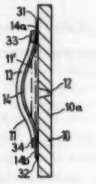


1. In a graphics plotter having a writing head adapted for traverse movement and holding a plurality of pens with writing tips, a pen capping mechanism comprising:
(a) a slider member adapted to move through an operative path and having an upper surface adapted to sealably mate with the writing tips of the pens, said member having a plurality of bores therethrough through which respective ones of the writing tips can pass to write, said bores being positioned such that as said member is moved through said operative path respective ones of said bores come into alignment with a pen tip such that only one pen tip at a time is in alignment with one of said bores; and,
(b) support means operably connected to the writing head for supporting said slider member for sliding movement adjacent said pen tips.

4,539,575
RECORDER OPERATING WITH LIQUID DROPS AND COMPRISING ELONGATES PIEZOELECTRIC TRANSDUCERS RIGIDLY CONNECTED AT BOTH ENDS WITH A JET ORIFICE PLATE

Kenth Nilsson, Akersberga, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,353
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1983, 3320441
Int. Cl.³ G01D *15/18*; H01L *41/04*
U.S. Cl. 346—140 R **7 Claims**

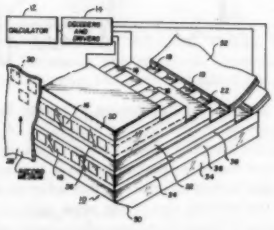


1. A recorder operating with liquid drops for the purpose of recording analog curves, alphanumeric characters, and/or images, said recorder comprising a plate with a row of jet orifices for the purpose of recording individual points, elongated piezoelectric transducers being arranged over the inlet sides of the respective jet orifices, said transducers being disposed parallel to one another with their respective opposite ends being rigidly secured at respective connection points with the plate, said transducers each being constructed such that an intermediate deflection zone thereof can be deflected as a result of electrically produced piezoelectric movement, to eject recording fluid through a respective associated jet orifice for application to a recording medium arranged at the discharge side of the jet orifices, the linear distance between the connection points at the respective ends of each transducer being less than the length along the transducer between said connection points.

4,539,576
ELECTROLYTIC PRINTING HEAD

Dudley A. Chance, Danbury, Conn., and Michael Sampogna, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,501
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—165 **17 Claims**



1. An improved electrolytic printing head having nonconsumable styli, for use in electrolytic printers of the type in which a record medium is drawn across a plurality of electrically conductive printing styli and an electrical potential is applied to selected ones of the styli to cause current to flow through and produce a mark on selected portions of the record medium, said printing head comprising:

a first lamina of electrically insulating corrosion resistant glass, said first lamina having an edge surface for contacting a record medium during use of said printing head;

a plurality of elongated electrically conductive printing styli each of which is fabricated of a mixture of ruthenium dioxide and corrosion resistant glass, said styli being supported at one side of said first lamina between a plurality of elongated grooves that are disposed in spaced parallel relation to one another and extend into said first lamina, said elongated printing styli terminating at and forming continuations of said edge surface for contacting a record medium during use of said printing head; and

a second lamina of electrically conductive material supported on the other side of said first lamina, said second lamina terminating at and forming a continuation of said edge surface for contacting a record medium during use of said printing head, said second lamina being fabricated of a mixture of ruthenium dioxide and corrosion resistant glass and being operative to function as a reference electrode when an electrical potential is applied between selected ones of said printing styli and said second lamina;

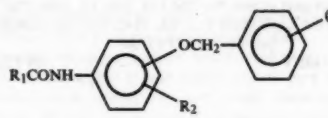
surface portions of said styli and of said second lamina remote from said edge surface being exposed to permit electrical connections to be made to said styli and to said reference electrode, and conductor means carried by and confined in extent to said exposed surface portions for making said electrical connections.

4,539,577
HEAT SENSITIVE RECORD MATERIAL

Kazuo Kaneko, Yokohama; Michihiro Gonda, Kitamoto; Susumu Suzuka, Yono, and Katsumasa Kitsukawa, Tokyo, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 651,038
Claims priority, application Japan, Sep. 30, 1983, 58-180473
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—207 **7 Claims**

1. A heat sensitive record material comprising a support sheet and a heat sensitive record layer formed on the support sheet, the heat sensitive record layer being composed essentially of a colorless or light-colored electron-donating colorless dye, an acidic substance which is thermally reactive with the electron-donating colorless dye to develop a color and a binder, characterized in that said heat sensitive record layer contains an effective amount of at least one anilide compound represented by the general formula:



(I)

where R_1 is an alkyl group having 1 to 6 carbon atoms or a cycloalkyl group; R_2 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a sulfamoyl group or a halogen atom; R_3 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms or a halogen atom; and n is an integer of 0 to 5.

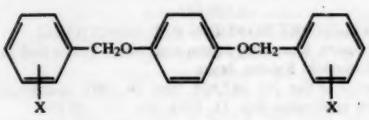
4,539,578
HEAT SENSITIVE RECORDING MATERIAL

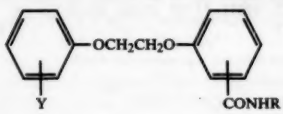
Akira Igarashi, and Hiroharu Matsukawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 9, 1984, Ser. No. 658,931
Claims priority, application Japan, Oct. 6, 1983, 58-187407
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—207 **6 Claims**

1. A heat sensitive recording material having on a support a

heat sensitive coloring layer which contains (a) an electron-donating colorless dye, (b) an electron-accepting compound and (c) at least one ether compound represented by formula (I) or (II)





wherein X represents a hydrogen atom, a halogen atom, an alkyl group containing not more than 6 carbon atoms, or an alkoxy group containing not more than 6 carbon atoms; Y represents a hydrogen atom, a halogen atom, an alkyl group containing not more than 6 carbon atoms, or an alkoxy group containing not more than 6 carbon atoms; and R represents a hydrogen atom or an alkyl group containing not more than 18 carbon atoms, said ether compound is used in an amount of from 10 wt% to 200 wt% based on the weight of the electron-accepting compound.

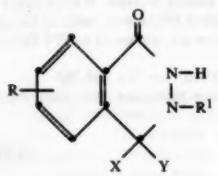
4,539,579

COMPOUNDS, PROCESSES AND MARKING SYSTEMS

Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Filed Nov. 5, 1982, Ser. No. 439,382
Int. Cl.³ B41M 5/20
U.S. Cl. 346—218 **16 Claims**

1. A substrate for use in electrochromic recording comprising a support sheet containing as a color-forming substance a 3-R^1-4-X-4-Y-R-phthalazin-1(2H)-one having the structural formula



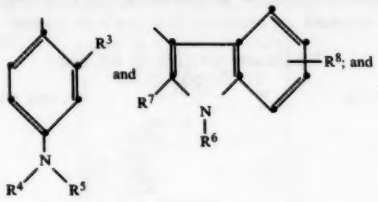
wherein:

R represents hydrogen, dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl, $COOR^2$ in which R^2 is hydrogen or non-tertiary C_1 to C_{16} alkyl or one to four halo;

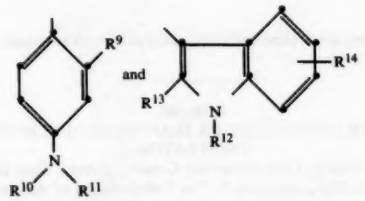
R^1 represents hydrogen, C_1 to C_3 alkyl, pyridyl,

in which Z is non-tertiary C_1 to C_4 alkoxy, $NHNH_2$, or non-tertiary C_1 to C_4 alkyl, phenyl or phenyl substituted by one or two of C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, halo, nitro or amino;

X is selected from the group consisting of



Y is selected from the group consisting of hydrogen,



in which

R^3 and R^9 independently represent hydrogen, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, acylamido in which acyl is non-tertiary C_2 to C_4 alkyl or dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl,

R^4 and R^{10} independently represent non-tertiary C_1 to C_4 alkyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl,

R^5 and R^{11} independently represent non-tertiary C_1 to C_4 alkyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl,

R^6 and R^{12} independently represent hydrogen, non-tertiary C_1 to C_{16} alkyl, non-tertiary C_2 to C_8 alkylene, phenoxy-ethyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl,

R^7 and R^{13} independently represent hydrogen, C_1 to C_3 alkyl or phenyl, and

R^8 and R^{14} independently represent hydrogen, halo, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy or nitro.

4,539,580

HIGH DENSITY INTEGRATED CIRCUIT DEVICE WITH MOS TRANSISTOR AND SEMICONDUCTOR REGION HAVING POTENTIAL WELLS

Junichi Matsunaga, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 16, 1982, Ser. No. 419,068
Claims priority, application Japan, Oct. 9, 1981, 56-161348
Int. Cl.³ H01L 29/94, 21/98
U.S. Cl. 357—23 **7 Claims**

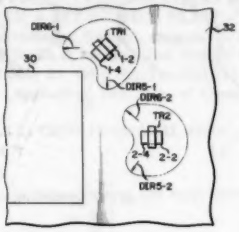
1. A semiconductor device comprising:

a semiconductor substrate;

a semiconductor region formed within said semiconductor substrate and having a potential locally susceptible to change by minority carriers; and

at least one MOS transistor having source and drain regions and which emits minority carriers of more than a predetermined number into said semiconductor substrate during operation in a saturation region, wherein said semiconductor region is arranged in an area defined by two boundary lines which start from said MOS transistor and form angles of substantially ±45° with respect to a line connect-

ing said source and drain regions, and wherein the material connecting said semiconductor region and said MOS



transistor is semiconductor material of uniform conductivity type.

4,539,581

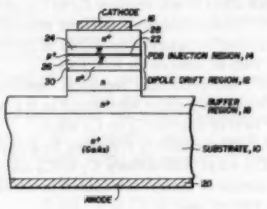
PLANAR DOPED BARRIER TRANSFERRED ELECTRON OSCILLATOR

Roger J. Malik, Little Silver, and Gerald J. Iafrate, Toms River, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 12, 1982, Ser. No. 397,340

Int. Cl.³ H01L *27/26, 29/12*

U.S. Cl. 357—58 **9 Claims**



1. A transferred electron semiconductor device comprising, in combination:

an anode region including a substrate of a first conductivity type semiconductor material having a high dopant concentration and a bufrer layer of said first conductivity type and high dopant concentration;

a drift region of semiconductor material of said first conductivity type having a relatively low dopant concentration formed on said anode region buffer layer, said drift region upon the application of an energizing potential of a predetermined magnitude having a differential negative resistance due to the transferred electron effect caused by a field induced transfer of conduction band electrons from a relatively low energy high mobility low satellite valley to a relatively higher energy low mobility upper satellite valley;

a cathode region including a planar doped barrier electron injection region contiguous to said drift region including a first layer of said first conductivity type of high dopant concentration, a second layer of substantially undoped semiconductor material on said first layer, a third relatively thin highly doped layer of a second conductivity type on said second layer, a fourth substantially undoped layer on said third layer, and a fifth highly doped layer of said first conductivity type on said fourth layer, said injection region establishing a controllable potential barrier and being operable to effect a transfer of electrons from said lower satellite valley to said upper satellite valley when said barrier is exceeded and thereafter inject said electrons into said drift region; and

means for applying said energizing potential between said anode and said cathode regions.

4,539,582

ANTI-SHORT BONDING PAD STRUCTURE

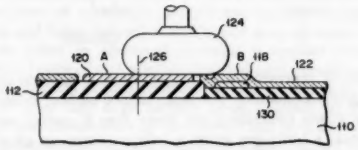
Akira Kuromaru, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 267,924, May 28, 1981, abandoned. This application Sep. 11, 1984, Ser. No. 649,955

Claims priority, application Japan, Jun. 10, 1980, 55-78158

Int. Cl.³ H01L *23/48, 29/46, 29/34, 29/06*

U.S. Cl. 357—71 **8 Claims**



1. A semiconductor device comprising:

a semiconductor substrate;

a first insulating layer formed on the semiconductor substrate;

a bonding pad having an upper surface formed on the first insulating layer;

a conductive layer formed on the first insulating layer adjacent and not directly connected to said bonding pad and spaced from said bonding pad a distance no greater than the widest dimension of said bonding pad; and

a second insulating layer formed to cover the conductive layer,

an upper surface portion of the second insulating layer which covers said conductive layer being next adjacent and lower than or level with the upper surface of the bonding pad.

4,539,583

DIGITAL INTEGRATED CHROMINANCE-CHANNEL CIRCUIT WITH GAIN CONTROL

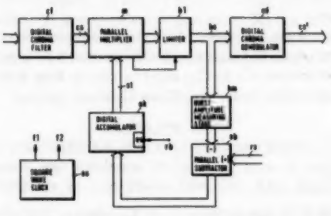
Peter M. Flamm, Freiburg; Daniel Mlynek, Wolfgantzes; Friedrich Schmidtpott, and Alfred Praxmarer, both of Gundelfingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 20, 1983, Ser. No. 486,755

Claims priority, application European Pat. Off., May 27, 1982, 82710033

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—27 **12 Claims**



1. A digital integrated chrominance-channel circuit with gain control for color-television receivers, comprising:

at least one integrated circuit for digitally processing the com-

posite color signal, wherein a digital chrominance signal appearing at an output of a digital chroma filter is applied to a first input of a parallel multiplier, and a digital gain control signal is applied to a second input of the parallel multiplier, the output of the parallel multiplier is connected to an input of a digital chroma demodulator with a color killer stage and to an input of a burst-amplitude-measuring stage whose output signal is compared with a reference signal in a control stage, the output signal of the control stage passes through an integrator whose output signal is the gain control signal;

a square-wave clock generator used as a chrominance subcarrier oscillator generates at least a first clock signal, whose frequency is four times that of the chrominance subcarrier, and a second clock signal, whose frequency is equal to that of the chrominance subcarrier; and

a first limiter is inserted between the parallel multiplier and the burst-amplitude-measuring stage, the control stage is a parallel subtracter whose minuend input is presented with the reference signal, and whose subtrahend input is connected to the output of the burst-amplitude-measuring stage and the integrator is a digital accumulator whose enable input is fed with a signal derived from the trailing edge of a burst gating signal.

4,539,584

TELEVISION CAMERA HAVING AN OPTICAL FILTER

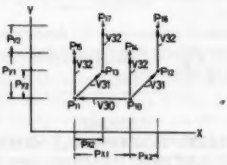
Yoshichi Otake, Kamakura, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Oct. 19, 1983, Ser. No. 543,399

Claims priority, application Japan, Oct. 22, 1982, 57-185488

Int. Cl.³ H04N *9/04, 9/07, 9/09;* **G02B** *5/28*

U.S. Cl. 358—44 **7 Claims**



1. A television camera which carries out color separation by use of vertical correlation in a picture, said television camera comprising:

a pickup element for scanning a target;

a color separating stripe filter; and

an optical filter for separating a single incident light beam in a direction which is the same as the scanning direction of said pickup element and a direction perpendicular to said scanning direction, by acting on said single incident light beam in two dimensions,

said optical filter comprising a first double refraction transparent plate for separating a light beam in a direction which coincides with said scanning direction of said pickup element, a second double refraction transparent plate for separating a light beam in a direction which is rotated by 45° with respect to said scanning direction, and a third double refraction transparent plate for separating a light beam in a direction perpendicular to said scanning direction, said first, second, and third double refraction transparent plates being stacked.

4,539,585

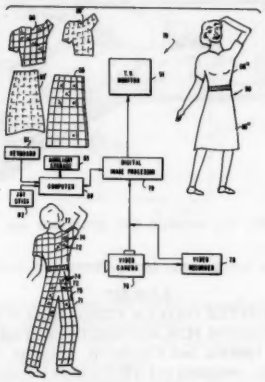
PREVIEWER

Daniela S. Spackova, 300 W. 55th St., New York, N.Y. 10019, and Richard M. Chen, 51-25 Goldsmith St., Elmhurst, N.Y. 11373

Filed Jul. 10, 1981, Ser. No. 282,055

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—93 **23 Claims**



1. A previewer comprising:

computer means to generate a graphic image of an article to be previewed;

means to store a plurality of video images of a subject, and further comprising means to select a specific frame of said subject images, and subject orientation reference means for each frame; said computer means accessing said subject image storage means, and having means to re-image said article in accordance with said subject orientation reference means for the specific selected frame, and means to form a composite image of said re-imaged article and said subject image for said selected frame, and means to display said composite image, said orientation means comprising indicia providing x-y-z axes orientation and angular rotation orientation with respect to said axes.

4,539,586

CONNECTOR MODULE FOR VIDEO ENDOSCOPIC SYSTEM

Dominick Danna, Syracuse; Robert C. Wheeler, Skaneateles, and Stanley R. English, Elbridge, all of N.Y., assignors to Welch Allyn Inc., Skaneateles Falls, N.Y.

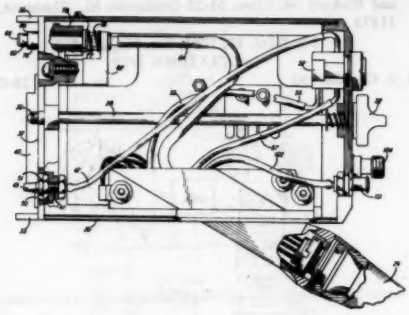
Filed Oct. 7, 1983, Ser. No. 539,982

Int. Cl.³ H04N *7/18;* **A61B** *1/04, 1/06*

U.S. Cl. 358—98 **20 Claims**

1. In a video endoscopic system including a video processor having an illumination source, a video monitor connected to the processor, and an insertion tube having a solid state imaging device at its distal end; the improvement comprising an interface module for releasably connecting the insertion tube to the processor, the proximal end of the insertion tube being operatively connected to the module, first coacting means in the module and processor for releasably securing the former to the latter, a fiber optic bundle in the module for transmitting light through the insertion tube to the distal end thereof, second coacting means in the module and processor for positioning the light receiving end face of the bundle at the focal point of the illumination source when the module and processor are secured together, an air supply conduit in the module for delivering air to the insertion tube, third coacting means in the module and processor for connecting the conduit in a sealed manner to an air supply conduit in the processor when the module and processor are secured together, and coacting

electrical connector means on the module and processor that operate to connect circuitry in the module with circuitry in the



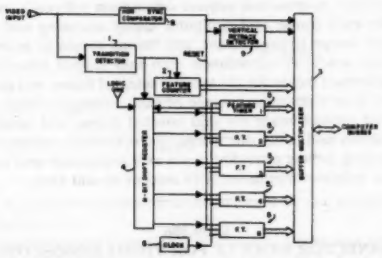
processor when the module and processor are secured together.

4,539,587

SHIFT REGISTER DRIVEN VIDEO MEASUREMENT SYSTEM FOR MICROCOMPUTER

John E. Eby, Ipswich, and Charles M. Kingston, Georgetown, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 30, 1983, Ser. No. 567,192
Int. Cl.[3] H04N 7/02, 9/62
U.S. Cl. 358—107 3 Claims



1. A video measurement system for coupling between a source of video signal and a computer buss and for quantizing information contained in a video signal and conditioning that information for a memory device such as might be comprised by a microcomputer, said system comprising:

a transition detector having an input for coupling to said source of video signal, said transition detector providing at its output a signal indicative of Black-to-White and White-to-Black transitions in the peak brightness level of the video signal,

a shift register having an input coupled to an output of the transition detector and at least N individual outputs,

N individual feature timers, each having an ENABLE input coupled to a shift register output and an output for coupling to the computer buss, and

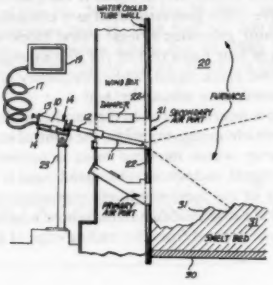
a clock having an output coupled to a CLOCK input of each of the feature timers, whereby the shift register operates in response to an output of the transition detector to selectively disable individual ones of the feature timers as determined by the transitions in the video signal so that the feature timers provide outputs representative of the duration between the beginning of a horizontal line and specified transitions in the video signal.

4,539,588

IMAGING OF HOT INFRARED EMITTING SURFACES OBSCURED BY PARTICULATE FUME AND HOT GASES

Peter C. Ariessohn, Sumner, and Richard K. James, Federal Way, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Feb. 22, 1983, Ser. No. 468,425
Int. Cl.[3] H04N 7/18
U.S. Cl. 358—113 10 Claims



1. An imaging apparatus for observing infrared emitting surfaces where the surfaces are substantially obscured by fume particles which strongly scatter visible light and by hot gas species which are themselves strong infrared emitters and which selectively absorb radiation from the infrared emitting surface which comprises:

a. image detection means sensitive in the infrared region for sensing an image of the emitting surfaces;

b. lens means for projecting and focusing the infrared image of the surfaces on the detection means;

c. optical filter means limiting the spectral sensitivity of the imaging apparatus to wavelengths longer than 1 micrometer and rejecting wavelengths strongly scattered by suspended fume particles and strongly radiated by or absorbed by said gaseous species overlying the surfaces to be imaged; and

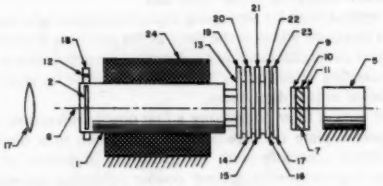
d. display means responsive to the detection means for producing a substantially interference free visual image of the surfaces being observed.

4,539,589

IMAGE STABILIZED ROTATIONAL MODULATOR FOR PYROELECTRIC IMAGING DEVICES

Robert W. Lindner, Caldwell, and Lucio M. Vallese, deceased, late of Glen Ridge, both of N.J. (Eleanor R. Vallese, executrix), assignors to Electrophysics Corporation, Nutley, N.J.

Filed Mar. 2, 1982, Ser. No. 353,827
Int. Cl.[3] H04N 3/08
U.S. Cl. 358—113 8 Claims



1. In a pyroelectric device having an image plane and means for focusing radiation onto the image plane to form a thermal image, the improvement comprising:

a planar, two-dimensional, pyroelectric target positioned at the image plane for generating a charge distribution pat-

tern corresponding to the thermal image, the target having a rotation axis perpendicular to the image plane and having rotational symmetry about said axis such that said thermal image is independent of said target's rotation about said axis;

scanning electron beam means for generating a signal responsive to the charge distribution of the target; and

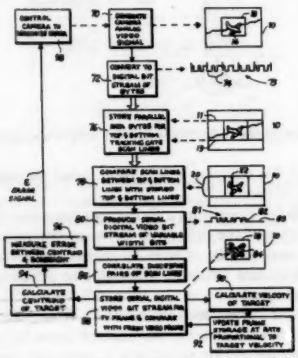
means for rotating the target about its rotational symmetry axis and relative to the scanning electron means, whereby the charge distribution pattern on the target is modulated and the signals generated by the scanning electron means are thereby representative of the thermal image.

4,539,590

METHOD AND APPARATUS FOR PROCESSING OPTICAL TRACKING SIGNALS

Richard J. Gage, 1500 NE. Malabar Blvd., Palm Bay, Fla. 32905

Filed Mar. 8, 1983, Ser. No. 473,225
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—125 **4 Claims**



1. In an optical tracking system having a television camera, having an analog video signal output, said camera disposed on a stabilized platform, and a tracking system for maintaining a target against a background centered on the boresight of the camera, the method of eliminating the background from the tracking system and providing a single level signal representative of the target comprising the steps of:

converting the analog video signal output to an n-bit per byte digital bit stream wherein each byte defines the gray level of a pixel;

storing a first sequence of n-bit bytes representative of the pixels of a first single television scanning line near the top of the television frame;

storing a second sequence of n-bit bytes representative of the pixels of a second single television scanning line near the bottom of the television frame;

comparing the sequence of n-bit bytes representative of the pixels of each horizontal scan occurring between said first scanning line and said second scanning line with said stored first sequence and with said stored second sequence, such comparison producing a serial digital two-level bit stream having a ZERO base line replacing said background and a plurality of variable width ONEs representative of a target being tracked by the optical tracking system; and

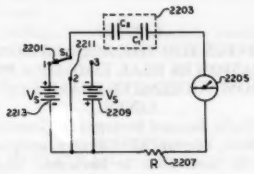
calculating an error signal between the target center and the boresight of the television camera for controlling of the tracking system.

4,539,591

METHOD OF IMPRESSING AND READING OUT A SURFACE CHARGE ON A MULTI-LAYERED DETECTOR STRUCTURE

Alfonso Zermeno; Lee M. Marsh, Jr., and Ronald W. Cowart, all of Houston, Tex., assignors to University of Texas System, Austin, Tex.

Division of Ser. No. 22,989, Mar. 22, 1979,. This application May 14, 1979, Ser. No. 38,831
Int. Cl.³ H04N *5/30, 5/76;* **H01J** *31/50*
U.S. Cl. 358—335 **7 Claims**



1. A method of recording and reading out a latent image comprising:

placing a surface charge on the photoconductive layer of a multilayered detector apparatus;

causing said surface charge to be distributed uniformly on said photoconductive layer;

biasing said photoconductive layer with an electronic field whose polarity opposes said surface charge;

discharing some portion of said surface charge of said photoconductive layer by exposing said detector to a modulated radiation flux capable of generating electron hole pairs in the photoconductor;

scanning the surface of said partially discharged photoconductive layer with a small diameter photon beam whereby surface charge is sequentially further discharged; and

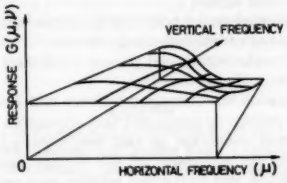
measuring the changing electric potential of said sequential further discharge as a function of time.

4,539,592

DOUBLE-SCANNING NON-INTERLACE TELEVISION RECEIVER

Yutaka Tanaka, Yokohama; Yasunari Ikeda, Funabashi, and Hiroshi Nakano, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 526,064
Claims priority, application Japan, Aug. 25, 1982, 57-147225
Int. Cl.³ H04N *5/02*
U.S. Cl. 358—140 **11 Claims**



1. A television receiver supplied with an interlace video signal, comprising:

signal converter means for converting said interlace video signal to a non-interlace signal including signal inserting means for inserting new line signals between two successive line signals of said interlace signal, said new line signals being formed by interpolating one of the preceding and succeeding line signals in said interlace signal, and

three dimensional filter means connected to said signal con-

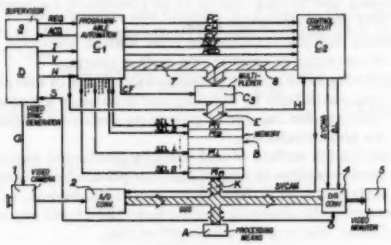
verter means for attenuating both vertical and horizontal high frequency components in said non-interlace video signal only when said non-interlace signal simultaneously includes said vertical and horizontal high frequency components, and producing an output signal fed to a picture tube of said television receiver.

4,539,593

APPARATUS FOR THE ACQUISITION AND RESTORATION IN REAL TIME OF A PICTURE FORMED FROM SUCCESSIVE FRAMES OF SCANNING LINES

Pierre Jutier, Paris; Bernard Bretagnolle, Grenoble, and Claire Rubat du Merac, Meylan, all of France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

Filed Dec. 29, 1982, Ser. No. 454,247
Claims priority, application France, Jan. 15, 1982, 8200590
Int. Cl.³ H04N 5/14
U.S. Cl. 358—160 **13 Claims**



1. An apparatus for the acquisition and restoration in real time of a picture formed by successive frames of scanning lines, comprising:

picture production means supplying analog signals which are representative of a picture;

at least one analog-digital converter receiving said analog signal and supplying first digital signals;

first processing means for processing said first digital signals in order to output second digital signals representing said picture;

storage means for storing said first digital signals and said second digital signals;

at least one digital-analog converter for receiving and converting said signals from said storage means;

means for synchronizing said picture production means and said digital-analog converter;

a communication bus connected between said storage means, said first processing means and said converters;

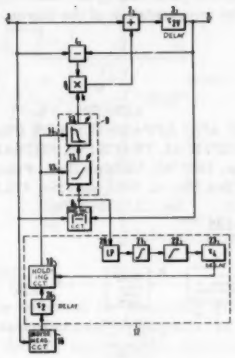
control means connected to said synchronizing means for controlling the addressing of said storage means and for synchronizing said converters wherein said control means includes a programmable automaton means and a wired control circuit means which wired control means is dependent on said automaton means and wherein said automaton means and said wired control circuit means have addressing outputs connected to addressing means of said storage means and wherein said control circuit means has synchronizing outputs connected to synchronizing inputs of said converters for permitting the acquisition and restoration of the picture corresponding to said digital signals recorded in said storage means.

4,539,594

SYSTEM FOR REDUCING NOISE IN A TELEVISION SIGNAL

Gerhard Illetschko, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 23, 1984, Ser. No. 582,929
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307687
Int. Cl.³ H04N 5/21, 5/14
U.S. Cl. 358—167 **5 Claims**



1. Apparatus for reducing noise in a television system including:

means (3) for delaying a television signal by one television frame interval;

means (8) for generating a signal representative of the absolute value of the difference between corresponding portions respectively of said television signals and of the output of said delaying means (3) to produce a picture motion signal;

controllable transfer-characteristic transmission means (11,12) having at least one control input for converting said picture motion signal into a correction factor signal;

means for measuring the noise in said television signal (16) and for deriving a noise amplitude signal therefrom and applying it to control said controllable transfer-characteristic transmission means, said signal deriving means (17) comprising:

means (26, 21, 22, 23) for deriving a hold-control signal from said picture motion signal, and

holding circuit means (18) interposed between said noise measuring means (16) and said at least one control input of said controllable transfer-characteristic means (11,12) for providing to the latter, during the presence of each said hold-control signal the last held value of the output of said noise measuring means preceding the appearance of said hold-control signal.

4,539,595

APPARATUS AND METHOD FOR CONVEYING CAMERA CONTROL INFORMATION ON THE BLACK BURST SIGNAL

James Warner, Woodbridge, Va., assignor to Remote Vision Systems Limited Partnership, Baltimore, Md.

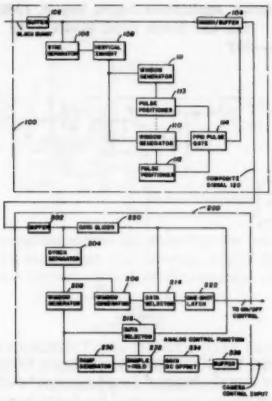
Filed Jun. 30, 1983, Ser. No. 509,583
Int. Cl.³ H04N 5/30
U.S. Cl. 358—210 **19 Claims**

1. Apparatus for communicating camera control characteristic information from a central unit to a remote camera, the central unit and the remote camera having a communication link therebetween over which a black burst signal, including (a) horizontal synchronization pulses and (b) pulses during

periodic vertical blanking intervals is sent from the central unit to the remote camera, the apparatus comprising:

first circuit means for defining a sequence of spaced time windows between each pair of the adjacent horizontal synchronization pulses of the black burst signal which occur outside the vertical blanking intervals; and

second circuit means for generating a pulse position modulated (PPM) pulse in each window defined between said each pair of adjacent horizontal synchronization pulses; and



third circuit means for superimposing the generated PPM pulses onto the black burst signal between said each pair of adjacent horizontal synchronization pulses, said PPM pulses being distinguishable from the black burst signal;

each window representing a variable camera control characteristic and the position of each PPM pulse in said each window indicating the value of the camera control characteristic represented by said each window.

4,539,596

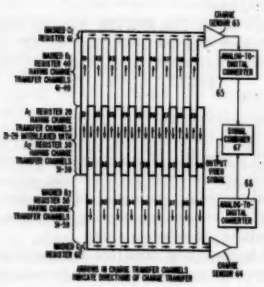
CCD IMAGERS WITH INTERLEAVED IMAGE REGISTERS USING OPPOSED DIRECTIONS OF CHARGE TRANSFER

Hammam Elabd, East Windsor, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 10, 1984, Ser. No. 659,459

Int. Cl.³ H04N *3/14*

U.S. Cl. 358—213 **2 Claims**



1. A CCD imager having:

first and second charge-coupled-device image registers each comprising a respective plurality of charge transfer channels and having their respective charge transfer channels spatially interleaved to receive a radiant energy image, each of said charge transfer channels having a respective output connection;

means for recurrently transferring charge packets in parallel through the charge transfer channels of said first image register in a first direction to the respective output connections of its charge transfer channels;

means for recurrently transferring charge packets in parallel through the charge transfer channels of said second image register in a second direction opposite the first direction to the respective output connections of its charge transfer channels; and

means responding to the charge packets transferred from the output connections of the charge transfer channels in said first image register and in said second image register for generating a video output signal.

4,539,597

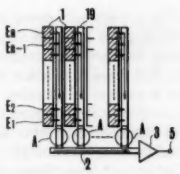
SOLID STATE IMAGE PICKUP DEVICE

Takao Kinoshita, Tokyo; Tokuichi Tsunekawa, and Yuichi Sato, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 383,248, May 28, 1982, abandoned. This application Dec. 21, 1984, Ser. No. 684,978

Int. Cl.³ H04N *3/14*

U.S. Cl. 358—213 **19 Claims**



1. A solid state image pickup device comprising:

(a) a plurality of light receiving means having light-to-charge converting ability;

(b) a plurality of vertical transfer paths for shifting electrical information generated in said light receiving means to a direction corresponding to the vertical scan line for a television signal;

(c) a plurality of holding means for holding each one of a sequence of information from the respective vertical transfer paths for a predetermined period;

(d) control means for controlling the operation of said holding means so that at least part of the information held by said holding means is dumped to the output a plurality of times during said predetermined period; and

wherein said holding means includes gate means for dividing the held information into parts which are produced at the output thereof.

4,539,598

IMAGE READOUT METHOD AND DEVICE

Klaus Dietrich, Gauting, and Walter Kroy, Ottobrunn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 28, 1982, Ser. No. 454,090

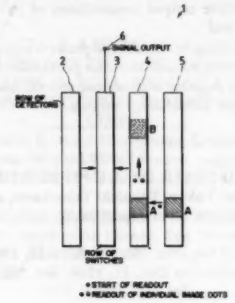
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1982, 3200838

Int. Cl.³ H04N *3/14*

U.S. Cl. 358—213 **4 Claims**

1. An image readout device for reading out a portion of an image representing information from detectors, comprising a plurality of image detectors arranged in at least one detector row or in detector rows and columns, switching means arranged in at least one switching row for each detector row said switching row having a signal output, means operatively con-

necting said switching row to its respective detector row for a readout addressing of individual image detectors and supplying respective image signals to said signal output, first and second shift register means for controlling said readout addressing, said first shift register means having a shift clock input and a plurality of outputs connected to said second shift register means for transferring the content of the first shift register means in parallel fashion into the second shift register means, said second shift register means also having a shift clock input and further means connecting said second shift register to



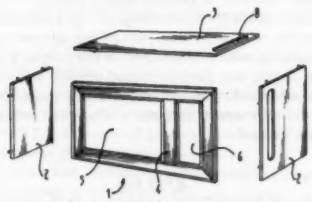
said switching row for serially addressing said switching row, wherein said first shift register means is arranged for determining a readout starting location (A) designated by one logic value in a respective shift register location while the respective opposite logic value is present in all other shift register locations and wherein a predetermined number of shift clock pulses steps the second shift register means from said readout starting location (A) to a readout stop location (B), said readout starting and stopping locations determining said portion of an image representing information.

4,539,599

ASSEMBLY FIXTURE FOR TELEVISION SETS

Bernard Revelin, Le Bois Randenais, Brugheas 03700 Bellervie sur Allier, France

Filed Jun. 9, 1982, Ser. No. 386,718
Int. Cl.³ H04N *5/64*
U.S. Cl. 358—254 **8 Claims**



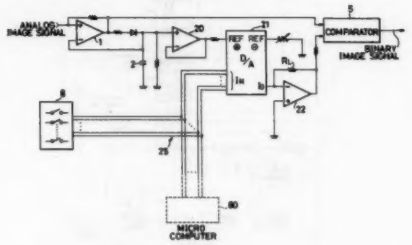
1. An assembly fixture for partially enclosing the cabinet of a television set, the fixture comprising a panel assembly having only a top panel, a front panel detachably secured to the top panel, and a pair of opposite side panels, each of the latter being detachably secured to both the top and front panels, respectively, the assembly fixture, in use, being placed over the cabinet of the television set to encompass the cabinet, and the front panel obscuring the front face of the cabinet and having a main aperture therein through which the picture screen of the television set is viewed, at least one of the panels having score lines defining a further aperture aligned with the control elements normally provided on the television set to provide access therethrough to permit a user to adjust the control elements.

4,539,600

IMAGE SIGNAL PROCESSING WITH A VARIABLE THRESHOLD

Shuichi Takahashi; Mitsuru Kondo, both of Sagamihara, and Kazuhiro Yuasa, Zama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Aug. 28, 1981, Ser. No. 297,201
Claims priority, application Japan, Sep. 4, 1980, 55-122853
Int. Cl.³ G06K *9/00*; H04N *1/40*
U.S. Cl. 358—282 **7 Claims**



1. An image signal processing apparatus for converting an analog image signal obtained by photoelectrically reading an original into a binary image signal for further processing comprising:

sample and hold means for sampling and holding the peak value of said analog image signal;

digital-to-analog converting means having a reference input and a set of digital inputs, said reference input being connected to receive an output voltage from said sample and hold means;

input means connected to the set of digital inputs of said digital-to-analog converting means for determining the level of the output of said digital-to-analog converting means in association with the voltage supplied to said digital-to-analog converting means from said sample and hold means; and

comparator means for converting said analog image signal into a binary image signal by using the output from said digital-to-analog converting means as a reference voltage.

4,539,601

PORTABLE VIDEO SYSTEM

Yoshio Komine, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 292,738, Aug. 14, 1981,. This application Aug. 29, 1983, Ser. No. 527,381
Claims priority, application Japan, Aug. 20, 1980, 55-117802
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—335 **11 Claims**

1. A portable video system including:

(a) a video camera for producing video signals and having a casing with a plurality of attachment surfaces;

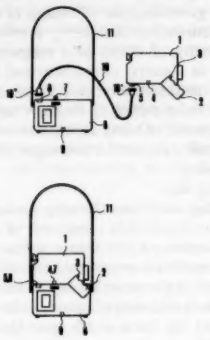
(b) video recorder for receiving the video signals from said camera and recording the signal on a recording medium;

(c) first coupling means for coupling said camera and said recorder with each other as a unit

(d) a signal transmitting cord for transmitting the video signals from the camera to the recorder when the camera and the recorder are not coupled together, said video recorder being heavier than the camera and having a recorder casing with a plurality of surfaces,

(e) said first coupling means including a tripod opening with threads at the bottom surface of the camera casing, and said recorder including a threaded bolt campatible with

the opening mounted in a manually rotatable manner at the top surface of the recorder casing, and



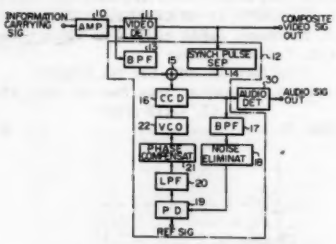
(f) second coupling means for coupling the recorder and a tripod with each other, and having a tripod opening with threads at a bottom surface of the recorder casing.

4,539,602

TIME AXIS CORRECTION DEVICE FOR MULTIPLEX INFORMATION-CARRYING SIGNAL OBTAINED FROM RECORDING MEDIUM

Takashi Okano, Tokorozawa, Japan, assignor to Pioneer Video Corporation, Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,128
Claims priority, application Japan, Jun. 30, 1981, 56-102975
Int. Cl.[3] H04N *5/91*
U.S. Cl. 358—337 **5 Claims**



1. A time axis correction device which corrects the time axis of an audio information-carrying component signal contained in a multiplex information-carrying signal which is read from a recording medium and further contains video information-carrying component signal with the standard horizontal synchronous pulse signal, which includes first separating means for separating said audio information-carrying component signal from said multiplex information-carrying signal, second separating means for separating said video information-carrying component signal from said multiplex information signal and for further separating said standard horizontal synchronous pulse signal from said video information-carrying signal, the time axis/correction device comprising:

an adder for adding said audio information-carrying signal and said standard synchronous pulse signal;

variable delay means for applying a delay to the added audio information-carrying and standard horizontal synchronous pulse signals, said delay being varied in accordance with a control signal;

third separating means for separating the horizontal synchronous pulse signal from the added and delayed signals;

error detecting means for detecting an amount of error in the time axis between a predetermined reference signal and the horizontal synchronous pulse signal from said third separating means; and

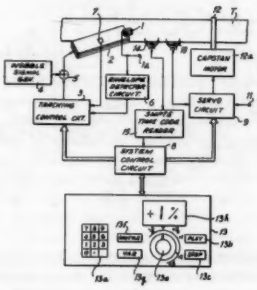
control means for producing said control signal representative of the amount of error.

4,539,603

VIDEO SIGNAL REPRODUCING DEVICE

Hajime Takeuchi, Kanagawa, and Yoshikazu Okuyama, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1983, Ser. No. 480,578
Claims priority, application Japan, Apr. 2, 1982, 57-54931
Int. Cl.[3] H04N *5/782*
U.S. Cl. 360—10.1 **14 Claims**



1. In a video signal reproducing device of the type including a magnetic head for reproducing said video signal recorded in slant tracks on a magnetic tape, said video signal including a program signal of a predetermined time duration when said tape is driven at a predetermined speed, transport means for driving said tape at a controllably varied speed, and tracking control means for supplying tracking control signals to said magnetic head whereby said head tracks said video signal, said device comprising system control means for controlling said transport means to drive said tape at a selected playback speed; and display means connected with said system control means for indicating the ratio of said predetermined time duration and a duration of the program signal as played back with said tape driven at said selected playback speed

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4,539,604

TRACKING SYSTEM IN A ROTARY MAGNETIC HEAD TYPE RECORDING AND/OR REPRODUCING APPARATUS

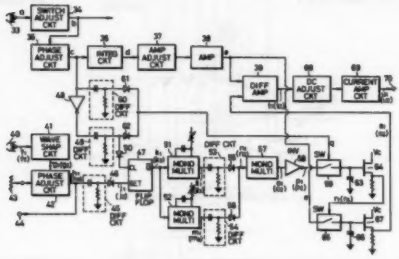
Yasuomi Namiki, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 260,593, May 6, 1981,. This application Jul. 21, 1983, Ser. No. 516,186
Claims priority, application Japan, May 7, 1980, 55-60317
Int. Cl.[3] G11B *21/10*
U.S. Cl. 360—10.2 **5 Claims**

1. A tracking system for use in a rotary magnetic type recording and/or reproducing apparatus, said apparatus having two opposing rotary heads mounted on opposite sides of a rotary body either for alternately and successively recording signals in oblique tracks on a recording medium, the tracks being oblique with respect to the longitudinal direction of said recording medium or for alternately scanning over said oblique tracks on said recording medium to reproduce recorded signals, moving means for continuously moving said recording medium past said rotary heads, a magnetic head moving mechanism comprising a combination of a coil and a magnet for displacing said two rotary heads at substantially the same time

with said displacement being in mutually opposite directions and by the same amount, the displacement being in a plane which is perpendicular to a plane in which said rotary heads rotate, said heads moving in response to an externally supplied driving signal, and a control head for recording a control pulse having a predetermined period onto said recording medium, said tracking system comprising:

driving signal producing circuit means for producing a driving signal having a waveform which gradually changes in amplitude with respect to one track scanning period of said rotary heads, said changing amplitude of said waveform moving said rotary heads gradually during reproduction in which said recording medium is continuously moved by said moving means at a speed which is



different from the speed used during recording, said driving signal producing circuit comprising circuit means for producing a first signal having a triangular waveform derived from a pulse obtained by detecting the rotation of said rotary body, sample-and-hold means for producing a second signal having a waveform which is a modification of the triangular waveform of said first signal, said sample-and-hold means being operated responsive to said pulse obtained by detecting the rotation of said rotary body and to a control pulse reproduced from said control head, and composition means for adding said first and second signals to obtain said driving signal; and

supplying means for supplying said driving signal from said driving signal producing circuit means to said magnetic head moving mechanism.

4,539,605

PCM TAPE RECORDING AND REPRODUCING APPARATUS HAVING A DROPOUT-IMMUNE DATA RECORDING FORMAT

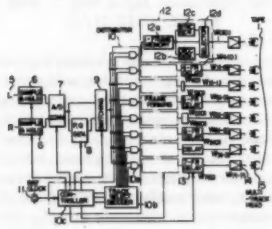
Takashi Hoshino, Fujisawa; Takao Arai, and Keizo Nishimura, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,244

Claims priority, application Japan, Sep. 11, 1981, 56-142292

Int. Cl.³ G11B *5/00, 5/09*

U.S. Cl. 360—32 **3 Claims**



1. A PCM tape recording and reproducing apparatus wherein an input analog signal is converted into digital data in serial form, said digital data being divided into frames, each frame containing a plurality of data words and an error detection word, and a given number of frames in series forming a group for error correction and being interleaved to be recorded on a plurality of tracks of a magnetic tape through multi-track heads in a matrix of columns and rows, said rows corresponding to the tape tracks, said digital data recorded on the magnetic tape being picked up through reproducing multi-track heads and thereafter being de-interleaved and converted into an analog signal to reproduce said input analog signal, said apparatus comprising:

on the recording side,

(a) track-selecting and frame-forming means for forming a series of input digital data composed of words having a prescribed number of bits into a series frames and for selecting a respective one of said plurality of tracks for receipt of each of the series frames in such a manner that adjacent ones of said series frames of the same group are located at least one track width apart from each other in the track width direction on said plurality of tracks of said magnetic tape;

(b) means for delaying sets of consecutive ones of said series frames of the same group, as assigned to said respective tracks by respectively different amounts relative to the track-length direction so that different columns containing frames of the same group are at least one column apart from each other on the tape tracks and for recording respective series frames thus dispersely arranged on said tape; and

on the reproducing side

(c) means for rearranging data picked up in parallel from said tracks on said magnetic tape by de-interleaving so as to produce said series data frames.

4,539,606

MAGNETIC REPRODUCING APPARATUS HAVING A CAPSTAN SERVO CIRCUIT

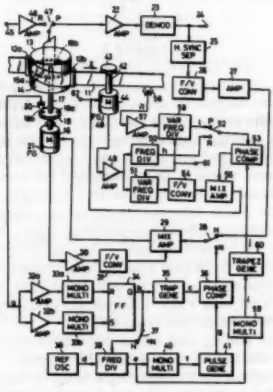
Kenji Itoh, Yokohama, Japan, assignor to Victor Company of Japan Ltd., Yokohama, Japan

Filed Nov. 23, 1983, Ser. No. 554,594

Claims priority, application Japan, Nov. 26, 1982, 57-207029

Int. Cl.³ G11B *5/008*

U.S. Cl. 360—70 **6 Claims**



1. A magnetic reproducing apparatus having a capstan servo circuit, said reproducing apparatus comprising rotary heads for reproducing a recorded video signal from tracks which are formed obliquely to the longitudinal direction of a magnetic tape, a drum motor for rotating said rotary heads, and a cap-

stan motor for rotating a capstan which drives said magnetic tape to travel, said capstan servo circuit comprising:

detecting means for detecting a rotation of said drum motor, and for producing a detection signal which is in accordance with the rotation of said drum motor;

reference signal generating means for generating a reference signal;

synchronizing means for synchronizing the phase of the reference signal which is generated from said reference signal generating means and the phase of the detection signal which is produced from said detecting means during a high-speed reproducing mode of said reproducing apparatus;

a control head for reproducing a recorded control signal from said magnetic tape;

phase comparing means for comparing the phase of the control signal which is reproduced by said control head with the phase of the reference signal which is generated from said reference signal generating means, and for producing an output signal; and

control means for controlling a rotation of said capstan motor by the output signal of said phase comparing means.

4,539,607

SERVO TRACK CONFIGURATION FOR MAGNETIC DISK APPARATUS

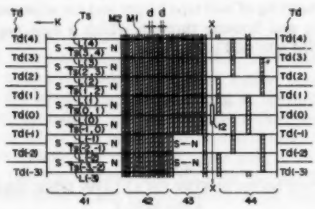
Masao Fujiki, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 29, 1982, Ser. No. 426,757

Claims priority, application Japan, Oct. 12, 1981, 56-160956

Int. Cl.³ G11B *5/48*

U.S. Cl. 360—77 **4 Claims**



1. A method of accurately determining the position of a magnetic head relative to a magnetic disk comprising the steps of:

dividing said magnetic disk inot alternating data sectors and servo sectors;

sub-dividing said servo sectors into servo tracks of individual width substantially equivalent to the width of said magnetic head;

establishing within each servo sector staggered nonrepeating magnetized unit regions each of which has a width twice that of one of said servo tracks;

obtaining peak value signals from said magnetized unit regions during relative movement of said head and disk; and

analyzing said peak value signals to obtain a position determining signal which is a two-phase signal having a cyclic 4-track period to thereby determine the position of said magnetic head within a given servo sector.

4,539,608

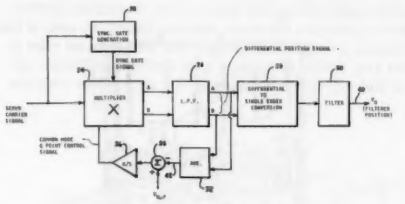
LOW OFFSET POSITION DEMODULAR

John P. Hill, Broomfield, and James J. Touchton, Boulder, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Dec. 8, 1982, Ser. No. 447,823

Int. Cl.³ H03D *1/06*; G11B *21/10*

U.S. Cl. 360—77 **22 Claims**



1. A low offset position demodulator for providing, in response to a servo carrier signal, a position signal that indicates the radial position of a head assembly with respect to a given track boundary between adjacent tracks of a rotating disk, said tracks on said disk having information selectively encoded thereon that distinguishes at least every other track, the head assembly providing the servo carrier signal in response to reading the encoded information from at least one of said tracks, said position demodulator comprising:

means for generating a gate signal synchronized with selected transistions of said servo carrier signal;

means for multiplying said servo carrier signal by said gate signal, thereby generating a product signal;

means for determining whether said product signal represents an "On Track" condition, indicating a desired radial position of said head assembly with respect to a selected track boundary, or an "Off Track" condition, indicating a non-desired radial position of said head assembly with respect to said selected track boundary;

means for maintaining the offset of said product signal at a prescribed level; and

conversion means for converting the findings of said determining means to said position signal, said position signal assuming a known value in response to an "On Track" condition.

14. An improved demodulator circuit that eliminates undesirable dc offset, said demodulator circuit comprising:

a balanced demodulator circuit including:

differential input signal lines to which a modulated carrier signal may be connected,

differential output signal lines from which a demodulated carrier signal may be recovered, at least one switching input signal line to which a switching gate signal for use in the demodulation process may be connected, and

a control line to which a control voltage may be connected in order to set the desired common mode quiesent operating point within said balanced demodulator circuit;

a low pass filter coupled to the differential output signal lines of said balanced demodulator circuit, said low pass filter also having differential output signal lines;

feedback means for averaging the signals appearing at the output signal lines of said low pass filter, comparing the resultant averaged signal to a reference signal, and coupling a signal representing the difference between said averaged signal and said reference signal to the control line of said balanced demodulator circuit; and

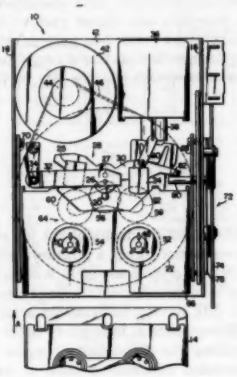
a differential-to-single-ended conversion circuit coupled to the output signal lines of said low pass filter, said conversion circuit thereby providing a single output signal line upon which an output signal representative of the information contained in said modulated carrier signal may be recovered.

4,539,609

CASSETTE TAPE RECORDER

Toshikazu Kato, and Akira Osanai, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,827
Claims priority, application Japan, Aug. 12, 1981, 56-126361
Int. Cl.³ G11B *15/32, 15/24, 5/008;* G03B *1/04*
U.S. Cl. 360—93 6 Claims



1. In an auto-reverse type cassette tape recorder comprising a base, a pair of side walls attached to the base, a capstan rotatably mounted on the base, a flywheel coaxially attached to the capstan to rotate together therewith, supporting means for bearing a magnetic head and a pinch roller and arranged on the base to be movable between an operating position and a non-operating position, a generally rectangular prism shaped cassette holder for containing a correspondingly shaped cassette therein and movable between a first position to allow the cassette to be inserted thereinto and removed therefrom and a second position for playback operation, a solenoid device having a plunger coupled with the supporting means for controlling the movement of the supporting means, a motor for driving the capstan and the flywheel to rotate, and a shifting device for controlling the movement of the cassette holder, the improvement in which:

said base is in the shape of a rectangle having a transverse length substantially equal to the longitudinal length of the cassette to be contained in the cassette holder;

said pair of side walls are attached to opposite side edges of the base, extending along the longitudinal direction of the base to face each other;

said capstan is located substantially in the transverse center of the base;

said flywheel has a diameter substantially equal to the transverse length of the base;

said supporting means is elongate and is pivotally arranged on the base along the transverse direction thereof, near the capstan and above the flywheel, said magnetic heads being located at both sides of the capstan;

said cassette holder is located between said pair of side walls, on the capstan side of the supporting means and near the capstan, wherein a substantial portion of the area of said cassette holder is located above the flywheel;

said solenoid device is mounted on the base on the opposite side of the supporting means to the capstan and near the supporting means, so that the plunger may move along the longitudinal direction of the base;

said motor is arranged on the base, side by side with the solenoid device along the transverse direction of the base, part of the solenoid device and part of the motor being located above the flywheel; and

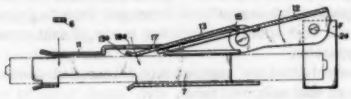
said shifting device is attached to one of the side walls along the longitudinal direction of the base.

4,539,610

PACK GUIDE MECHANISM

Kazuki Takai, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1983, Ser. No. 564,857
Claims priority, application Japan, Dec. 24, 1982, 57-226251; Dec. 24, 1982, 57-226252; Dec. 24, 1982, 57-226253
Int. Cl.³ G11B *5/008, 15/00*
U.S. Cl. 360—93 9 Claims



1. A tape player having a tape pack guide mechanism which comprises:

an elongate guide arm supported at one end for pivotal movement around a pivot axis disposed in the tape player so that its other end moves generally vertically;

a pack guide supported for substantially vertical movement in the tape player between an upper position and a lower position and adapted to have a tape pack inserted therein;

connecting means cooperable with said other end of said guide arm for operatively connecting said guide arm to an upper part of said pack guide;

at least one thrust piece supported on said guide arm and extending to a location inside said pack guide so that an end portion of said thrust piece is positioned on a side of said connecting means remote from said pivot axis; and

an engaging portion formed on said pack guide and adapted to engage said end portion of said thrust piece when said pack guide is in its upper position;

wherein when said pack guide is in its lower position said thrust piece engages an upper side of a tape pack in said pack guide and urges it downwardly, and wherein when said pack guide is in its upper position said thrust piece engages said engaging portion of said pack guide and urges said pack guide against stoppers which are provided on a housing of said tape player and are adjacent an opening in said housing through which a tape pack can be inserted into said pack guide.

4,539,611

DRIVE MOTOR FOR SHALLOW DISK DRIVE ASSEMBLY

Pawitter S. Sidhu, 2900 Corda La., Bel Air, Calif. 90049, and Gary M. Delgado, 1745 Carmelina Ave., Los Angeles, Calif. 90025

Filed Sep. 24, 1982, Ser. No. 422,645
Int. Cl.³ G11B *5/016*
U.S. Cl. 360—99 3 Claims

1. As an article of manufacture, in combination, a floppy disk drive unit including a chassis frame, the said chassis frame having a relatively shallow depth dimension, means forming a part of the chassis frame providing a cavity forming a motor housing, the said motor housing being circular and including an integral central bushing part adapted to receive a vertically oriented shaft and bearing means for confining said shaft to maintain its vertical orientation while permitting axial movement thereof, one circular side of said housing being open, a stator member including windings positioned at a top of the housing around said bushing, means providing an armature mounted to said shaft to rotate about the central axis of said bushing, the said armature including a rotor member having a

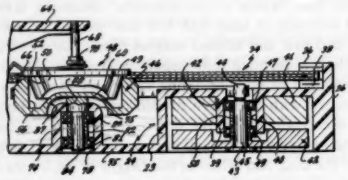
permanent magnet located below said stator, means for restraining the axial movement of said shaft including said permanent magnet having a relationship to the said stator whereby to be held in position by magnetism.

4,539,612

SPINDLE BEARING ASSEMBLY FOR DISK DRIVE UNIT

Pawitter S. Sidhu, 2900 Corda La., Bel Air, Calif. 90049, and Gary M. Delgado, 1745 Carmelina Ave., Los Angeles, Calif. 90025

Filed Sep. 29, 1982, Ser. No. 427,598
Int. Cl.³ G11B *5/016, 5/012*
U.S. Cl. 360—99 **7 Claims**



1. As an article of manufacture, in a low profile floppy disk drive unit, in combination, a chassis frame, the frame having a bottom, a cylindrical disk drive spindle, a drive cone cooperable with the spindle, the spindle having an upwardly dished bottom part extendable into the cone, the dished part providing a recess below it, a bushing positioned coaxially with the axis of the spindle and cone, the upper part of the bushing extending into the said recess, a shaft for the spindle coaxial with the said bushing and bearing means in the bushing journalling the said shaft.

4,539,613

LOADING APPARATUS FOR A RECORDING MEDIUM

Satoshi Suyama, Neyagawa; Kiyotaka Uehira, Hirakata; Kenji Sanpei, Yahata; Kenichi Sakamoto, Osaka, and Koichiro Nakagawa, Takarazuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 13, 1983, Ser. No. 484,551
Claims priority, application Japan, Apr. 13, 1982, 57-61597
Int. Cl.³ G11B *17/04*
U.S. Cl. 360—99 **6 Claims**

1. A loading apparatus for a recording medium comprising:

a base body;

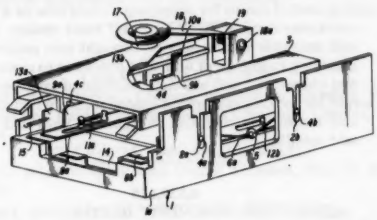
means for holding a recording medium and holding means being reciprocally in vertical directions toward and away from the base body while keeping a horizontal orientation, said holding means being urged in a direction toward said base body;

holder guide means, provided on said holding means, for guiding the movement of said holding means;

at least one slide plate reciprocally movable in directions parallel with inserting and discharging directions of the recording medium and being urged in a direction parallel with the discharging direction of the recording medium;

at least one raised member, provided on said at least one slide plate, for supporting said holder guide means against the urged direction of said holding means when the recording medium is not inserted into said holding means;

said at least one raised member, when the recording medium is fully inserted into said holding means, being pushed by the recording medium to a position in which said raised member releases the holder guide means so that said holding means moves in the vertical direction toward said base body;



a discharging plate reciprocally movable in directions parallel with the moving directions of said at least one slide plate and being urged in a direction parallel with the discharging direction of the recording medium; and

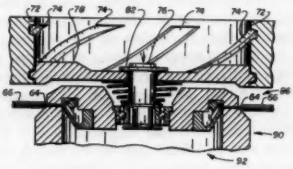
at least one cam member, provided on said discharging plate, said at least cam member, when said discharging plate is moved by an external force in a direction against the urged direction of said discharging plate, pushing up said holder guide means in the direction away from said base body, thereby moving said holding means in a vertical direction away from said base body to a position where said holder guide means is supported by said at least one raised member.

4,539,614

FLEXIBLE MAGNETIC DISK CLAMPING AN INJECTOR MECHANISM

Herbert E. Thompson, Los Gatos, Calif., assignor to Drivetec, Inc., Milpitas, Calif.

Filed May 18, 1983, Ser. No. 495,801
Int. Cl.³ G11B *17/04, 23/04*
U.S. Cl. 360—99 **26 Claims**



1. A disk drive having a frame including a front end, left and right side walls disposed at opposite ends of said front end, a support member connected between said side walls and said front end of said frame, a face plate connected outward of and adjacent to said front end so as to be substantially perpendicular to said support member, having an aperture in said support member and a spindle extending through said aperture, said spindle connected to said drive and including a first inner wall defining a first recess therein and an abutment surface for

supporting an associated flexible magnetic disk adjacent to a central opening thereof, a mechanism for appropriately providing either a centering and clamping action or an ejection force to said flexible magnetic disk, said mechanism comprising:

a guide slot in said face plate for accepting and fully enclosing said flexible magnetic disk, said guide slot including alignment means and end stops which the disk rests against when fully inserted;

rotatable means for centering and clamping said disk to said spindle, said rotatable means being positioned in axial alignment with said spindle;

rotor means adapted for connection to said rotatable means for driving said rotatable means between a disk clamping position and a disk releasing position as said rotor means turn in a clockwise or counterclockwise direction;

spring-loaded means for supplying a clockwise or a counterclockwise turning motion to said rotor means, whereby said rotatable means may be brought into centering and clamping engagement with said disk so as to center it with and clamp it to said abutment surface of said spindle; and

means for locking said spring-loaded means when said rotatable means is in clamping engagement with said disk and said spindle.

4,539,615

AZIMUTHAL MAGNETIC RECORDING AND REPRODUCING APPARATUS

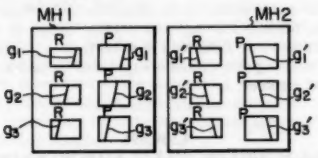
Takao Arai; Shigeru Yamazaki, both of Yokohama; Yasunori Kanazawa, Hachioji, and Takaharu Noguchi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 386,073

Claims priority, application Japan, Jun. 8, 1981, 56-86940; Jun. 8, 1981, 56-86941; Jun. 26, 1981, 56-98251; Aug. 17, 1981, 56-127799

Int. Cl.³ G11B 5/28

U.S. Cl. 360—121 **11 Claims**



1. An azimuthal magnetic recording and reproducing apparatus comprising a magnetic head including at least one head gap for the recording and at least one head gap for reproduction of information on and from recording tracks extending in the longitudinal direction of a magnetic tape, said head gap for recording and said head gap for reproduction including means for enabling the magnetic recording and reproducing operation so that the direction of magnetization on one of said recording tracks differs from that on the adjacent one of said recording tracks, said apparatus being of the type in which said magnetic tape is driven in a first direction and then in a second or opposite direction, said head gap for recording and said head gap for reproduction being in a first position relative to said magnetic tape when said magnetic tape is driven in said first direction and said head gap for recording and said head gap for reproduction being in a second position relative to said magnetic tape when said magnetic tape is driven in said second direction, and said apparatus further comprises magnetic head rotating means for inclining said magnetic recording and reproducing magnetic head, so that, when said magnetic tape is driven in said first direction, said magnetic head is rotated by said rotating means through a first predetermined angle in a first direction relative to the axis orthogonal with respect to the travelling direction of said magnetic tape, and, when said magnetic tape is then driven in said second direction, said magnetic head is rotated by said rotating means through a second predetermined angle in a second direction opposite to said first direction relative to said axis, said first and second predetermined angles providing an azimuth angle, and said head gap for reproduction having a width extending in a direction transverse to the direction of movement of said magnetic tape which is larger than the width of said head gap for recording.

4,539,616

THIN FILM MAGNETIC HEAD AND FABRICATING METHOD THEREOF

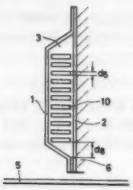
Isamu Yuito, Ohem; Kazuo Shiiki, Tsukui; Atsushi Saiki, Koganei; Yoshio Homma, Hachioji; Noriyuki Kumasaka, Ohme; Yoshihiro Shiroishi, Hachioji, and Mitsuhiro Kudo, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 20, 1982, Ser. No. 400,019

Claims priority, application Japan, Jul. 27, 1981, 56-116403

Int. Cl.³ G11B 5/22, 5/20

U.S. Cl. 360—125 **13 Claims**



1. A thin film magnetic head comprising: first and second magnetic pole layers; a non-magnetic insulating layer sandwiched between at least said first and second magnetic pole layers; said first and second magnetic pole layers forming an operation gap through said insulating layer; and a conductor layer disposed in said insulating layer and forming a coil of plural turns, with each turn of said coil having a height in a direction extending from the first to the second magnetic pole layer and having a width, and with a space between successive turns of the coil, and wherein the height of each turn is made larger in at least a portion of said coil than the width of said coil turn and than the space between said turn and an adjacent turn.

4,539,617

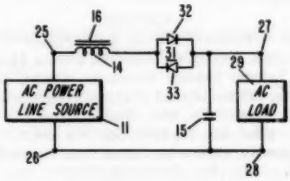
AC POWER LINE TRANSIENT SUPPRESSING CIRCUIT

Sean Delaney, and Herbert R. Montague, both of Binghamton, N.Y., assignors to Control Concepts Corporation, Binghamton, N.Y.

Filed Dec. 28, 1983, Ser. No. 566,432

Int. Cl.³ H02H 9/04

U.S. Cl. 361—58 **19 Claims**



1. In combination, an AC source having AC power terminals, an AC load having AC load terminals, a capacitor connected in a branch shunting the AC load terminals, an inductor and bi-directional breakdown means connected between the AC power terminals and AC load terminals so that the same current flows from one of the AC power terminals through the

inductor and bi-directional breakdown means, said same current being divided to flow in parallel through the AC load terminals and the shunt branch.

4,539,618

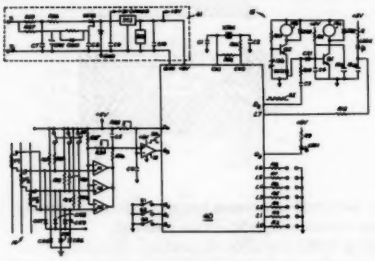
DIGITALLY CONTROLLED OVERLOAD RELAY

Frederick A. Stich, Milwaukee, Wis., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Division of Ser. No. 365,861, Apr. 5, 1982, Pat. No. 4,456,871. This application Jan. 5, 1984, Ser. No. 568,400

Int. Cl.³ H02H *3/08*

U.S. Cl. 361—94 **5 Claims**



1. In an overload relay including means for monitoring current flow in a circuit, electromagnetic interrupter means having contacts for breaking said circuit and control means coupled to sensing means for causing said interrupter to interrupt said circuit upon the detection of an overcurrent condition, the improvement comprising:

means for generating a train of substantially identical pulses;

receiving means coupled to said electromagnetic interrupter and responsive to said train of pulses for maintaining said interrupter in a closed position;

means for terminating said train of pulses upon the detection of an overcurrent condition;

R-C filter means connected between said control and sdid electromagnetic interrupter and responsive to a pulse train of a particular frequency and magnitude for maintaining energization of said electromagnetic means, said electromagnetic interrupter including:

a first winding for opening said contacts, current control means in series with said winding for controlling current flow therethrough, and means coupling said current control means to said R-C circuit;

a second control winding for causing said contacts to close; second current control means coupled in series with said winding to control current flow therethrough; and

means coupling said second current control means to said R-C circuit for causing current to flow through said second winding upon interruption of said pulse train.

4,539,619

HIGH ENERGY DEGAUSSER

James D. Hill, Mount Airy, Md., assignor to General Kinetics, Inc., Rockville, Md.

Filed Nov. 5, 1982, Ser. No. 439,550

Int. Cl.³ H01F *13/00*

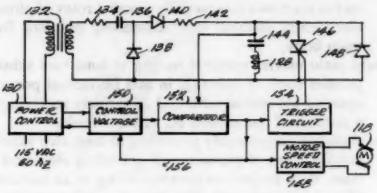
U.S. Cl. 361—151 **40 Claims**

1. Apparatus for degaussing a magnetized object comprising:

means for storing energy;

means for gradually applying energy to said storing means; and

means for repeatedly releasing energy from said storing means to said object, said releasing mean cooperating with said applying means to reduce the energy stored in said storing means at the time of release with each said repeated release of energy, said releasing means including



means for reversing the polarity of said energy with respect to said object over said repetitions.

4,539,620

CERAMIC CAPACITOR

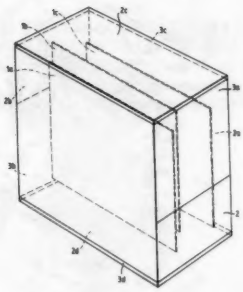
Edmund Gray, Harlow, England, assignor to Standard Telephones and Cables, Public Limited Company, London, England

Filed Feb. 15, 1984, Ser. No. 580,213

Claims priority, application United Kingdom, Mar. 2, 1983, 8305759

Int. Cl.³ H01G *1/11, 4/10*

U.S. Cl. 361—275 **8 Claims**



1. A ceramic capacitor comprising two or more parallel layers of electrically conductive material separated by dielectric material and enclosed in a body of ceramic material, the conductive layers extending alternatively to one only of two different edge or surface portions of the ceramic body, none of the layers extending to any other edge or surface portions of the body, two other edge or surface portions of the body being provided with respective electrically conductive terminations, each of said two edge or surface portions to which conductive layers extending being provided with an electrically conductive fusible film coating making electrical connection with all of the layers extending to that portion, said coatings each extending over a part of the body surface to make electrical connection to a respective one only of the terminations.

4,539,621

INTEGRATED CIRCUIT CARRIER AND ASSEMBLY

David W. Currier, Algonquin, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1982, Ser. No. 450,891

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—386 **41 Claims**

6. An integrated circuit (IC) carrier subassembly comprising:

a main carrier member having a horizontal portion, and

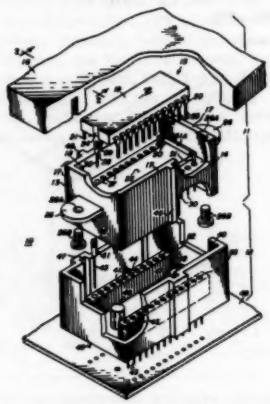
an integrated circuit (IC) mounted to said main carrier member,

said IC comprising an integral package having a main body and at least two substantially parallel rows of pluralities of electrically external leads extending outward from said main body,

said main carrier member having at least two substantially parallel rows of openings in said horizontal portion, each opening associated with and effectively receiving at least a portion of one of said IC external leads,

said carrier subassembly providing at least two substantially parallel rows of pluralities of extending electrical projections, each projection corresponding to an associated one of said IC leads and extending in a substantially vertical linear direction from an associated one of said openings in said horizontal portion, said two rows of openings and their corresponding rows of projections arranged substantially longitudinally overlapping and being normally spaced apart by a dimension at least large enough to permit finger access therebetween,

said main carrier member having walls forming, on at least one vertical side of said horizontal portion, at least one effective open carrier channel surrounding at least one of said rows extending projections, said walls extending substantially vertically from said horizontal portion parallel to and in the same direction and substantially beyond the extending projections and effectively recessing said projections within said carrier subassembly, said carrier member including means for preventing finger access to said projections in said channel from at least said one vertical side of said horizontal portion, while providing electrical access to said projections from said one vertical side,



wherein said IC main body is located on the vertical side of said horizontal portion opposite to the vertical side on which said channel is formed, and

wherein said carrier subassembly includes a plurality of metallic carrier contacts, at least equal in number to the number of IC leads, each contact having a receptacle opening at one end thereof and an extending pin portion at an opposite end thereof, each of said carrier contacts being mounted in an associated one of said openings in said horizontal portion of said main carrier member with the extending pin portion extending from each opening in said row of openings into said carrier channel and serving as said extending projection, said carrier member means preventing finger access from said one vertical side of horizontal portion to said pin portions which extend into said channel from said openings in said one row while providing electrical access to said pin portions from said one vertical side, each of said carrier contact receptacles effectively receiving an associated one of said IC leads.

4,539,622

HYBRID INTEGRATED CIRCUIT DEVICE

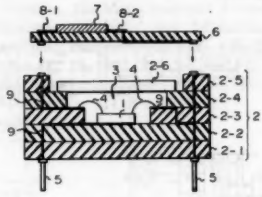
Hidehiko Akasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 390,873, Jun. 22, 1982, abandoned. This application Oct. 25, 1984, Ser. No. 664,931

Claims priority, application Japan, Jun. 25, 1981, 56-94877[U]

Int. Cl.[3] **H05K** *1/09, 1/14*

U.S. Cl. 361—401 **4 Claims**



1. A hybrid integrated circuit device, comprising:

(a) a semiconductor circuit element;

(b) a multilayer ceramic package including—

(i) a first frame member having a first surface and a second surface and creating a cavity therebetween for incorporating said semiconductor circuit element therein,

(ii) a cap mounted on the second surface of said first frame member so as to seal said cavity, and

(iii) a second frame member having a first surface and a second surface, wherein the first surface of the second frame member is mounted on said second surface of said first frame member and surrounding said cap, said cap being thinner than said second frame member;

(c) external connection terminals mounted on the multilayer ceramic package opposite the second frame member;

(d) a base having a first surface and a second surface, wherein the base's first surface is mounted on said second surface of said second frame member;

(e) first and second conductive patterns formed on said base; said second conductive pattern being bonded to said first conductive pattern by soldering; and

(f) a film resistor pattern formed on the second surface of said base and electrically connected to said first and second conductive patterns and to said semiconductor circuit element, said film resistor pattern being trimmed so that the resistance value of said film resistor pattern is adapted to the characteristics of said semiconductor circuit element.

4,539,623

SOLID ELECTROLYTIC CHIP CAPACITOR WITH IMPROVED TERMINALS

Tsutomu Irikura, Joyo, and Nobuo Hasegawa, Uji, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Continuation of Ser. No. 249,560, Mar. 31, 1981, abandoned. This application Dec. 24, 1984, Ser. No. 684,990

Claims priority, application Japan, Apr. 2, 1980, 55-43965

Int. Cl.[3] **H01G** *9/00*

U.S. Cl. 361—433 **4 Claims**

1. A solid electrolytic chip capacitor comprising:

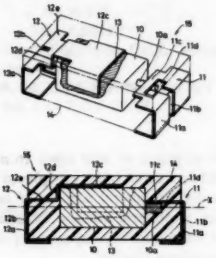
(a) a capacitor element having an anode member with a dielectric oxide film on the surface thereof, an electrolytic layer and a cathode layer both stacked on said anode member one after the other, and an anode lead connected to said anode member and projecting outwardly from the body of said capacitor element;

(b) a casting made of an insulating synthetic resin for sup-

porting and surrounding said capacitor element, said casting having first and second sides which face each other, and upper and lower surfaces;

(c) an anode terminal having a flat portion electrically connected to said anode lead at the upper portion of said anode lead, said anode terminal being drawn from said casting via said first side, and bent so that said anode terminal other than said flat portion is situated along said first side and said lower surface of said casting; and

(d) a cathode terminal having a U-shaped portion at its one end for receiving said capacitor element therein so that said cathode layer is electrically connected to said cathode terminal, and a flat portion connected to said U-shaped portion via a crank-shaped neck portion so that



said U-shaped portion, said neck portion and said flat portion constitute a crank-shaped portion, said cathode terminal being drawn from said casting via said second side, and bent so that said cathode terminal other than said crank-shaped portion is situated along said second side and said lower surface of said casting;

said flat portion of said cathode terminal being flush with said flat portion of said anode terminal, a plane including said flat portions of said cathode and anode terminals is positioned above a center line bisecting the height of the capacitor body, said flat portions being embedded in said casting such that one end of each of said flat portions is a portion where said cathode or anode terminal is drawn from said casting.

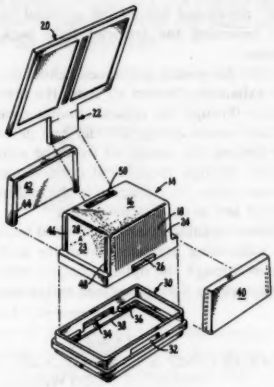
4,539,624

DIFFUSION DEVICE FOR FLASH GUN

Kenneth Stone, P.O. Box G, Boulder Creek, Calif. 95006

Filed Aug. 10, 1984, Ser. No. 639,690
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—16 **4 Claims**

1. A diffusion device for a flash gun said flash gun having a rectangular translucent, flat light emitting surface at one end thereof, comprising a box-like member having a top, sides, back and front of a translucent material and an open bottom and having first means for attaching said device to a flash gun with the open bottom adjacent the light emitting surface of the flash gun and having second attachment means for attaching said device to a flash gun, said second attachment means including an adaptor ring having a first surface fitting over the



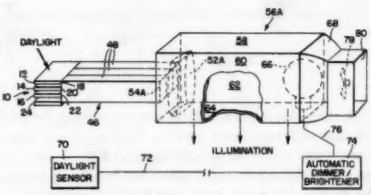
end of a flash gun and a second surface fitting the open end of the diffusion device.

4,539,625

LIGHTING SYSTEM COMBINING DAYLIGHT CONCENTRATORS AND AN ARTIFICIAL SOURCE

Jonathan G. Bornstein, Miami, Fla., and Peter S. Friedman, Toledo, Ohio, assignors to DHR, Incorporated, McLean, Va.

Filed Jul. 31, 1984, Ser. No. 636,242
Int. Cl.³ F21V *7/04*
U.S. Cl. 362—32 **16 Claims**



1. A combined lighting system for an interior of a building comprising:

a non-rotative stack means, composed of at least one luminescent solar concentrator (LSC), for receiving daylight;

said LSC stack means being located outside of the building, having a bottom with at least three sides, and being composed of a plurality of differently colored light absorbing plates;

an optical conduit means, having two ends and being coupled to one of the sides of the stack means, for transmitting light from the LSC stack means;

a lens means, positioned at an end of the optical conduit means, for collimating the light at a set angle;

an interior fixture means, having two ends and being coupled at one end to the optical conduit means, for receiving light at the set angle from the collimating lens means and for distributing the light as illumination into the building interior;

a source means, positioned at an opposite end of the fixture means, for directing artificial light into the fixture means for distribution as illumination into the building interior;

an automatic means, connected to the artificial light source means, for dimming and brightening the artificial light distributed as illumination;

daylight sensor means, positioned outside the building near to the LSC stack means, for controlling the automatic dimming and brightening means in response to the daylight sensed;

means, positioned behind the artificial light source means, for reflecting the artificial light back into the fixture means;

reversible fan means, positioned behind the reflecting means, for exhausting heated air from the artificial light source means through the optical conduit means and out of the fixture means during summer and in warm climates and for forcing the heated air from the artificial light source means through the optical conduit means and into the fixture means for passage into the building interior during winter and in cold climates; and

ventilation opening means, positioned behind the fan means, for exhausting heated air from the artificial light source means through the optical conduit means and out of the fixture means during summer and in warm climates.

4,539,626

INDICATOR LAMP AND HEADLAMP MOUNTING TO VEHICLE BODYWORKS

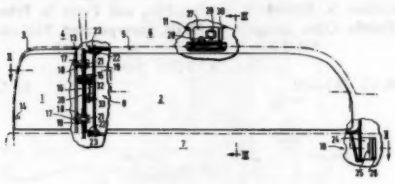
Christian Hawlitzki, Pulheim, and Heinz Dick, Odenthal, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 7, 1983, Ser. No. 549,132

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1982, 3242245

Int. Cl.³ F21V *3/18*

U.S. Cl. 362—66 **7 Claims**



1. An indicator lamp and headlamp mounting for a vehicle in which the indicator lamp and the headlamp are mounted on opposite sides of a web separating two bodywork sections by means of an alignment component, the headlamp being secured to the bodywork by at least two further mountings, wherein the alignment component includes an adjustable spacing stop screw which ensures a preset spacing between the indicator lamp and the headlamp unit and in which alignment pins are formed on the indicator lamp, which pins project through apertures in the web into holes in a headlamp holding plate securable to the web, the holding plate having means for enabling the headlamp to be aligned both vertically and horizontally with the indicator lamp.

4,539,627

HEADLIGHT DEVICE WITH TWO LIGHTS FOR MOTORCYCLES

Tetsuo Ogishima, Shiki, Japan, assignor to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Sep. 21, 1984, Ser. No. 653,444

Claims priority, application Japan, Sep. 26, 1983, 58-148603[U]

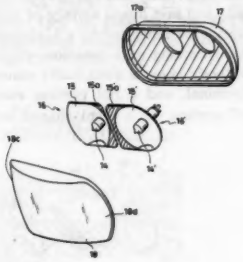
Int. Cl.³ B62J *17/02*

U.S. Cl. 362—72 **10 Claims**

1. A headlight device for a motorcycle having a fairing covering a front portion of said motorcycle, said fairing having an internal space defined therein and a front opening facing said internal space, comprising:

a pair of light units each having a light bulb, and a reflector disposed behind said light bulb;

a single light casing disposed in said internal space of said fairing and having an open front face and an outer peripheral surface, said pair of light units being accommodated within said light casing and juxtaposed with each other therein;



lens means arranged at said open front face of said light casing and having an outer peripheral surface; at least one of said outer peripheral surface of said light casing and said outer peripheral surface of said lens means being tightly fitted in said front opening of said fairing along the whole periphery thereof.

4,539,628

NONGLARE LIGHT FIXTURES FOR A ROD-SHAPED LIGHT SOURCE

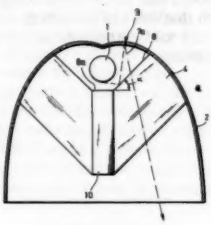
Christian Bartenbach, Lindenschmittstrasse 23, 8000 Munchen 70, Fed. Rep. of Germany

Filed Apr. 2, 1984, Ser. No. 595,592

Claims priority, application Austria, Apr. 8, 1983, 1246/83; European Pat. Off., Dec. 20, 1983, 83112800.4

Int. Cl.³ F21V *11/06*

U.S. Cl. 362—217 **3 Claims**



1. In a light fixture with a rod-shaped light source and concave reflectors on both longitudinal sides of the light source extending above the light source, the concave reflectors having a curvature such that all the rays of light reflected across the light source emerge in the transverse direction either directly or after reflection at an angle that is steeper than a light-specific masking angle α, and with lamellae that have an approximately V-shaped cross section and run across the vertical middle longitudinal plane of the light source and have reflecting concave side surfaces with a curvature such that all the rays of light reflected in the longitudinal direction of the light source emerge in the longitudinal direction either directly or after reflection at an angle that is steeper than a light-specific masking angle β, and the top sides of the lamellae are covered by a flat reflecting cover, the improvement comprising:

the lamellae are shaped so as to form two lamellar sections

that are symmetrical with respect to the middle vertical longitudinal plane of the light source; and

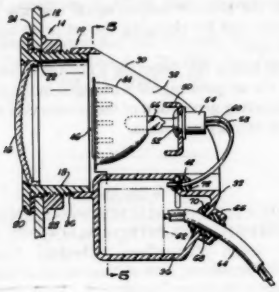
the flat top sides of the lamellae are reflective and run obliquely with respect to the longitudinal plane and with the opposite slopes on opposite sides of the longitudinal plane, starting below the light source, at an angle that corresponds approximately to the masking angle α with tangential but contact-free proximity to the light source, and extending as far as the concave reflectors, so that light rays obliquely leaving the light source will strike the oblique reflecting top surfaces of the lamellae and thus are reflected upwardly to strike the concave reflectors at an angle at least substantially as steep as the masking angle α, thereby reducing glare caused by relatively shallow angle reflected light rays.

4,539,629

SPA LIGHT

Charles B. Poppenheimer, Pasadena, Calif., assignor to GTY Industries, Sun Valley, Calif.

Filed Feb. 10, 1984, Ser. No. 579,207
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—267 **7 Claims**



1. A light for a spa, comprising

a lens head having a lens and means for mounting said lens head to the spa with said lens facing inwardly in said spa;

a housing positionable on said lens head to extend outwardly from the spa and having a transformer cavity and an open lamp cavity;

a reflector positioned in said open lamp cavity facing said lens;

a lamp socket for receiving a lamp and said reflector;

said lamp cavity being open upwardly and outwardly from said spa to allow convection air flow past said lamp and water flow from said open lamp cavity with said housing positioned on said lens head.

4,539,630

BRIGHTNESS AND COLOR REGULATABLE LAMPSHADE

Shan W. Shew, P.O. Box 10780, Taipei, Taiwan, Taiwan

Filed Feb. 15, 1983, Ser. No. 466,539
Int. Cl.³ F21P *3/00*
U.S. Cl. 362—318 **1 Claim**

1. A decorative lampshade for use with and surrounding a light source comprising:

an annular translucent outer wall having an upper end and a lower end,

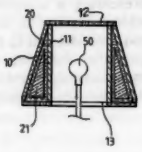
an annular translucent inner wall having an upper end and a lower end, said upper end of said outer wall integrally sealed to said upper end of said inner wall,

a toroidal lower wall having an inner edge and outer edge, said outer wall lower end sealed to said lower wall outer edge and said inner wall lower end sealed to said lower wall inner edge,

an annular translucent body within said walls,

a colored liquid within said walls surrounding said body,

a regulating bolt having a higher end and a lower end, said higher end rotatably secured within said body, said bolt extending through said lower wall,



an under-frame having an annular hole frictionally receiving one side of said bolt lower end,

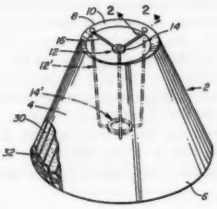
whereby rotation of said under-frame with respect to said walls rotates said bolt which adjusts the height of said body within said walls regulating the amount of liquid between the walls and the brightness and color of said light source.

4,539,631

LAMP SHADE AND METHOD

Gilbert R. Lieberman, 161 Harland, Hampstead, Quebec, Canada

Filed Jul. 2, 1984, Ser. No. 627,101
Claims priority, application Canada, Mar. 8, 1984, 449153
Int. Cl.³ F21V *11/00*
U.S. Cl. 362—351 **11 Claims**



1. A lamp shade comprising a hollow seamless shell or foundation molded from plastic material and having upper and lower openings and having support means removably secured thereto for supporting the shade with respect to a light bulb or lamp fixture,

the upper opening having an inwardly projecting collar molded integrally therewith and extending therearound, and at least two holes provided in the collar;

the shade support means having outwardly extending arms which are secured in respective holes in the collar by fastening means.

4,539,632

PROGRAMMABLE MAINTENANCE TIMER SYSTEM

John C. Hansen, Spring Grove, and Lloyd A. Johnson, Dover, both of Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 28, 1982, Ser. No. 425,733
Int. Cl.³ G06F *15/46*; G05B *19/04*; G05D *23/32*
U.S. Cl. 364—143 **4 Claims**

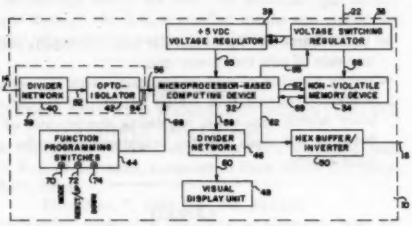
1. A programmable maintenance timer system suitable for use with industrial equipment such as a centrifugal water chill-

ing system and a telemetry system, said timer system comprising:

interface circuit means for receiving an AC electrical signal and for generating a pulse signal in response to said electrical signal;

a microprocessor-based computing means for calculating a signal representative of total elapsed operating hours of an industrial equipment in response to said pulse signal;

said microprocessor-based computing means including programming means for presetting selectively a maintenance time interval representing a number of operating hours before a maintenance service is to be performed, for counting down said time interval to zero, and for generating an output signal after said time interval has reached zero to a telemetry system so as to alert service personnel that the industrial equipment is due for a scheduled maintenance;



display means responsive to said signal representative of the total elapsed operating hours for indicating visually the total elapsed operating hours;

and function programming switching means for controlling mode of operating of said microprocessor-based computing means;

said switching means including a mode switch for activating said display means to indicate either the total elapsed operating hours, the hours remaining on the maintenance time interval before reaching zero, or the preset maintenance time interval; a reset/up switch for returning the maintenance interval to the beginning preset maintenance interval value so that it counts down again to zero and for adjusting selectively by increasing the desired maintenance interval; and a down switch for adjusting selectively by decreasing the desired maintenance interval.

4,539,633

DIGITAL PID PROCESS CONTROL APPARATUS

Takashi Shigemasa, and Yoshinori Ichikawa, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 10, 1983, Ser. No. 503,310

Claims priority, application Japan, Jun. 16, 1982, 57-102100; Sep. 25, 1982, 57-166041; Sep. 25, 1982, 57-166042

Int. Cl.[3] **G05B** *13/04*

U.S. Cl. 364—162 **8 Claims**

1. A digital PID process control apparatus comprising:

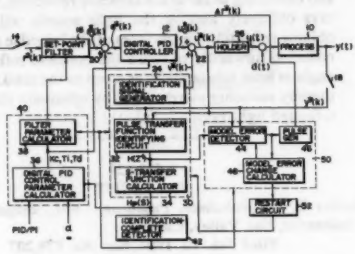
digital PID controlling means for calculating a control signal as a process input signal in accordance with PID control parameters and a difference between a set-point signal and a process signal as a process output signal so as to supply the control signal to a process;

identifying means for identifying a pulse transfer function of the process in accordance with the process input signal and the process output signal while superposing a persistently exciting signal as an identification signal on the control signal and supplying a superposed signal to the process, and for calculating an S-transfer function of the process in accordance with the identified pulse transfer function;

tuning means for tuning the PID control parameters of said digital PID controlling means in accordance with the S-transfer function;

identification-complete detecting means for detecting a convergence of the S-transfer function so as to stop generating the persistently exciting signal by said identifying means;

characteristic change detecting means for detecting a model



error of the process in accordance with the process input signal, the process output signal and the pulse transfer function, and for changing the set point signal in a pulse form; and

restarting means for detecting a change in the model error when the set point signal is changed in the pulse form and for restarting generation of the persistently exciting signal by said identifying means.

4,539,634

MODIFICATION OF MACHINING PROGRAM IN A NUMERICAL CONTROL MACHINE TOOL

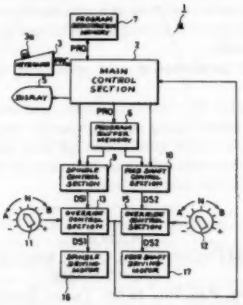
Takayoshi Sakai, Kagamihara; Kiyohisa Mizoguchi, and Masazumi Hayakawa, both of Nagoya, all of Japan, assignors to Yamazaki Machiner Works, Ltd., Aichi, Japan

Filed Jan. 28, 1983, Ser. No. 462,076

Claims priority, application Japan, Feb. 2, 1982, 57-15275

Int. Cl.[3] **G05B** *19/18;* **G06F** *15/46*

U.S. Cl. 364—167 **3 Claims**



1. A numerical control machine tool comprising:

a program memory for storing a machine program having steps to be sequentially executed;

a spindle for relatively turning a workpiece and machining tool;

a spindle driving motor for driving said spindle;

a feed shaft for relatively moving a workpiece being machined and a machining tool;

a feed shaft driving motor for driving said feed shaft;

means for controlling said spindle driving motor and feed

shaft driving motor to operate in accordance with speeds defined by a step of the program being executed;

operator manipulatable spindle override means for controlling spindle speed regardless of the speed called for by the program step being executed;

operator manipulatable feed shaft override means for controlling feed shaft speed regardless of the speed called for by the program step being executed;

operator manipulatable program amendment command means for generating a program amendment instruction when actuated; said instruction causing the machining step being executed to be amended in program memory to define speeds called for by said spindle override means and feed shaft override means; and

means, responsive to said program amendment means, for causing said machine tool, on further executions of said program step, to operate in accordance with the speeds called for by said spindle and feed shaft override means without the need for further manipulation of said program amendment command means.

4,539,635

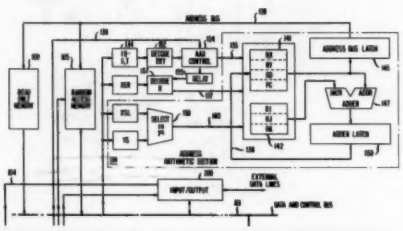
PIPELINED DIGITAL PROCESSOR ARRANGED FOR CONDITIONAL OPERATION

James R. Boddie, Hazlet, and John S. Thompson, Tinton Falls, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 120,059, Feb. 11, 1980, abandoned. This application Jul. 23, 1982, Ser. No. 401,350

Int. Cl.[3] **G06F** *7/38*

U.S. Cl. 364—200 **3 Claims**



1. A digital processor arranged for pipelined data processing operations wherein a data word is processed arithmetically into a resultant data word and a status signal during each processor cycle, the resultant data word being written to a destination; the digital processor comprising

a plurality of processor sections, including at least an arithmetic, a set register and a write memory section, each processor section being arranged to process one data word while the other processor sections concurrently are processing different data words during every processor cycle;

source means for providing a sequence of conditional and unconditional opcode words, a different opcode word controlling processing every processor cycle, each opcode word including a plurality of control fields, a conditional opcode word being designated $I_i(c,s,t)$ and an unconditional opcode word being designated $I_{i+1}(l,m, \ldots s,t)$, where $i=0,1,2, \ldots$ represents consecutive processor cycles and $(i+1)$, $(i+2)$ . . . represents a consecutive sequence of processor cycles, $I_i(c)$ is a conditional control field, $I_i(s,t)$ are control fields, $I_{i+1}(l)$ is an unconditional multiplier control field and $I_{i+1}(m)$ is an unconditional accumulator control field, each unconditional control field designated $(i+1)$ including information for determining concurrent steps in processing a selected expression of an operand y_{i+2};

means (IR-C, IR-S,T, 211, 212, 213, 214, 215, 122 and DECODE F) for decoding the conditional opcode word $I_i(c,s,t)$ during a first processor cycle $(i+1)$ of the consecutive sequence of processor cycles and the unconditional opcode word $I_{i+1}(l,m, \ldots s,t)$ during a second and next consecutive processor cycle $(i+2)$ of the consecutive sequence of processor cycles;

means for receiving and storing an operand y_{i+2} during the second processor cycle of the consecutive sequence of processor cycles; and

means for executing in the arithmetic, set register and write memory processor sections the processing defined by the unconditional opcode word $I_{i+1}(l,m, \ldots s,t)$ during a third processor cycle $(i+3)$ of the consecutive sequence of processor cycles except for the arithmetic section, which is responsive to some of the decoded fields $I_{i+1}(l,m, \ldots s,t)$ during the third processor cycle for processing the operand y_{i+2} during the third processor cycle if the condition defined by the conditional control field $I_i(c)$ is met by the status signal and is disabled for processing the operand y_{i+2} during the third processor cycle if the condition defined by the conditional control field $I_i(c)$ is not met by the status signal.

4,539,636

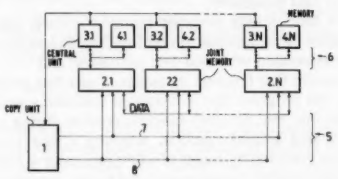
APPARATUS FOR INTER-PROCESSOR DATA TRANSFER IN A MULTI-PROCESSOR SYSTEM

Paavo Sääksjärvi, Kirkkonummi, Finland, assignor to Elevator GmbH, Baar, Switzerland

Continuation of Ser. No. 277,006, Jun. 24, 1981, abandoned. This application Nov. 30, 1984, Ser. No. 676,599

Int. Cl.[3] **G06F** *15/16, 13/00, 3/04*

U.S. Cl. 364—200 **5 Claims**



1. A system for transferring data between central units of processors in a multi-processor system, said system comprising central units with central memories, an internal bus for the transmission of data between individual ones of said central units, joint memories, and copying means for clocking the joint memories; and wherein

the central units of processors are separated from said internal bus by said joint memories, a data transfer among all the joint memories is effected by said copying means;

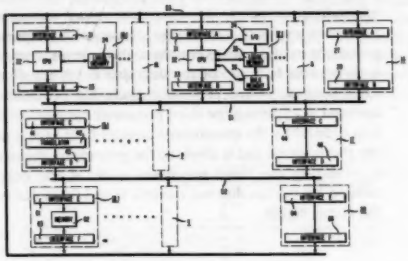
each of said joint memories includes its own address generation means responsive to common clock synchronization signals of the copying means transmitted to all of the joint memories for simultaneous transfer of data without transference of address signals among all the joint memories and;

all of said address generation means generate the same address concurrently in response to said clock synchronization signals without a computation of separate addresses, thereby permitting continuous transfer of data independently of any normal operation of said central units.

4,539,637
METHOD AND APPARATUS FOR HANDLING INTERPROCESSOR CALLS IN A MULTIPROCESSOR SYSTEM

Dennis L. DeBruler, Downers Grove, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 26, 1982, Ser. No. 411,899
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 44 Claims



1. In a multiprocessing system having a plurality of processors each of the processors having an associated work queue, the method of executing a program process, having an associated program function context stored in memory accessible by each of said processors, by different processors, comprising the steps of:

initiating a process comprising a first and a second function in any of said plurality of processors;

storing an indication of the identity of a first processor and of the address of a first function at an address specified as part of a second function;

executing said second function by means of a predetermined one of said processors, including entering data into said program function context stored in memory accessible by each of said processors;

storing a link to said program function context and said indication of the address of said first function in the work queue associated with said first processor; and

executing said first function by means of said first processor using said program function context containing said data entered into said program function context during execution of said second function, whereby a first program function executed by means of a first processor is linked to a second program function executed by any processor and uses a program function context containing data entered during execution of said second function.

4,539,638
COMMAND LANGUAGE SYSTEM FOR INTERACTIVE COMPUTER

John Gaffney, Los Gatos, Calif., assignor to Evans & Sutherland Computer Corp., Salt Lake City, Utah

Continuation of Ser. No. 000,845, Jan. 4, 1979,. This application Sep. 24, 1981, Ser. No. 305,239
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—300 4 Claims

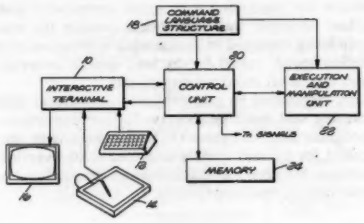
1. In an interactive computer including an interactive terminal means, memory means, program control means and execution means, an improved command language system wherein command language names are interpreted in different contexts in said program control means related to the sequence in which they are encountered, comprising:

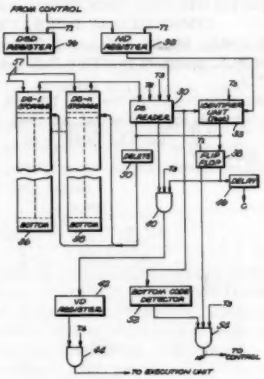
at least one dictionary stack for storing name-interpretation signals representative of names and of different interpretations of the names for use in program commands by said execution means;

means controlled by said control means for sensing name-interpretation signals in a fixed predetermined sequential order from said dictionary stack;

name means for specifying a particular name under control of said program control means;

means for testing names of said name-interpretation signals in said predetermined sequential order with a name specified by said name means to identify the first occurrence of





an association therebetween in said predetermined sequential order;

means for supplying said name-interpretation signals identified as of said first occurrence to said execution means as a current interpretation of the particular name specified; and

means for discarding said name-interpretation signals identified as of said first occurrence from said dictionary stack.

4,539,639
PROCESS FOR OBTAINING THREE-DIMENSIONAL IMAGES OF AN OBJECT AND ITS APPLICATION TO THE TOMOGRAPHY OF AN ORGAN

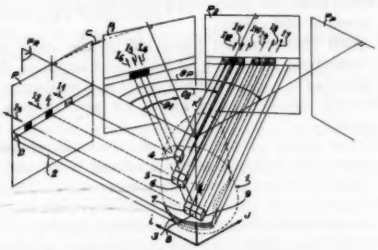
Gérard Le Coq, Fesnes, and Francoise Soussaline, Paris, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 4, 1983, Ser. No. 463,811
Claims priority, application France, Feb. 17, 1982, 82 02632
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—414 9 Claims

1. A process for obtaining three-dimensional images of an object from radiation emitted by a tracer contained in said object, said radiation being received by certain detection areas of a planar detector, designated by numbers n in the plane of said detector, the latter performing a rotary movement around the object, so that it constantly remains tangential to an imaginary cylinder of revolution (C), whose axis corresponds to an axis of the object, the angular positions of the planar detector being designated by angles θ_p between a reference plane (PR) passing through the axis of the object and a plane passing

through the axis of the object and perpendicular to the plane of the detector, the object being assumed as broken down into elementary cells for the emission of radiation designated by their coordinates in a fixed reference mark (i, j, k), axis k of said mark being parallel to the axis of the object, the radiation received by certain detection areas being those which are emitted by the elementary cells of the object in a direction perpendicular to the plane of the detector, the detection areas supplying, for each angular position θ_p, electrical signals whose amplitudes have values dependent on the intensities of the radiation received, said amplitude values being stored in order to obtain the images of the object, in the sectional planes, of ordinates k perpendicular to the axis of the object, wherein, for obtaining images of the object in the sectional planes, it comprises:

producing on the basis of the stored amplitude values, for each sectional plane of ordinates k, for all the angular positions θ_p, and for all the detection areas of number n receiving the radiation, correction values of said amplitude values, whereby these correction values are obtained on initialization, on the basis of simulated amplitude values, corresponding to a simulated image of the object in which it is assumed that the distribution of the tracer is uniform, and from stored correction factors relating to the attenuation (u) of the radiation in the object, as a function of coordinates (i, j) of each elementary cell and relating to the geometry of each detector;



determining and storing for each sectional plane, for all the angular positions (θ_p) and for all the detection areas of numbers n which receive the radiation, the values of the respective differences between the values of the amplitudes of the signals supplied by these areas and the correction values, the images corresponding to the values of the amplitudes of the signals supplied by the detection areas being available for the sectional planes for which the values of the differences comply with a predetermined convergence criterion, then, when the values of the differences do not comply with the predetermined criterion, the process then comprises:

producing other correction values of the signal amplitude values, for the sectional planes of ordinates k, for all the angular positions θ_p and for all the detection areas of numbers n which receive the radiation, said other correction values being obtained from values of stored differences, on the basis of said correction factors and on the basis of stored filtering coefficients (λ) of said other correction values;

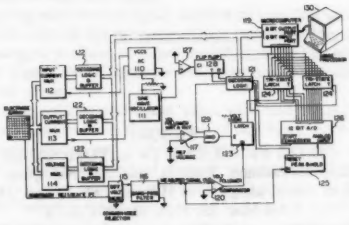
performing for each sectional plane of ordinates k, for all the angular positions (θp) and for all the detection areas receiving the radiation, additions between respectively the stored amplitude values and the other correction values, the values of the results of these additions being stored, in order to supply the corresponding images of the object in the sectional planes or ordinates k or to obtain new correction values on the basis of the results of said additions until these results converge.

4,539,640

RECONSTRUCTION SYSTEM AND METHODS FOR IMPEDANCE IMAGING

Bradley Fry, and Alvin Wexler, both of Winnipeg, Canada, assignors to Tasc Ltd., Winnipeg, Canada

Filed Aug. 10, 1982, Ser. No. 407,275
Claims priority, application Canada, Jan. 12, 1982, 393977
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—414 **18 Claims**



1. A method of displaying an image of the interior of a structure having a plurality of surfaces and comprising regions of different conductivities which differentially affect electrical signals transmitted therethrough, said method comprising the steps of:

(a) applying electrical input currents at a plurality of selected current input sites of said structures, each of said electrical input currents flowing within at least one of said regions and exiting from said structure at a selected current output site thereof;

(b) measuring the voltages generated by each of said applied currents at a plurality of selected voltage measuring sites of said structure with respect to a voltage reference point, each of said selected voltage measuring sites being remote from the current input and output sites through which flows the current generating said voltages;

(c) calculating the voltages ϕ at a plurality of locations within said structure, including said selected voltage measuring sites, with respect to said voltage reference point from the equation

$$-\nabla\cdot\kappa\nabla\phi=f,$$

where κ is a value of conductivity assumed for each of said locations and f is the density of each of the electrical input currents at said current input and output sites, the current traversing the surfaces of said structure except at said current input and output sites being assumed equal to zero;

(d) calculating the electrical current flux density $\bar{J}$ at each of the locations for which the voltage was calculated in step (c) from the equation

$$\bar{J}=-\kappa\nabla\phi;$$

(e) comparing the voltages calculated in step (c) for each of said selected voltage measuring sites of said structure and the corresponding voltages measured at said selected sites in step (b);

(f) repeating steps (c) and (d) when the difference between the voltages compared in step (e) are greater than a predetermined amount, the voltages measured in step (b) then being substituted at said selected voltage measuring sites for the voltages calculated in step (c);

(g) calculating new values for κ for each of said locations when the squared residual sum R equals

$$\sum_X \int\int\int_V (\bar{J}+\kappa\nabla\phi)\cdot(\bar{J}+\kappa\nabla\phi)\,dv$$

where V is the region over which the imaging is being performed and X represents the excitations over which the sum is taken, by determining the values of κ which minimize R throughout said structure;

(h) repeating steps (f) and (g) until the voltages compared in step (e) do not exceed said predetermined amount; and

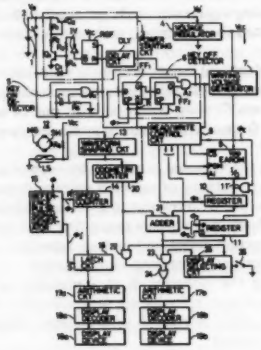
(i) displaying the values of κ calculating in step (h) thereby providing an image of the interior of said structure.

4,539,641

DATA PROCESSOR IN AUTOMOBILES

Norishige Kawashimo, Kodaira, and Joe Nakajima, Mitaka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 361,477
Claims priority, application Japan, Mar. 23, 1981, 56-40303
Int. Cl.³ G01C *22/00*
U.S. Cl. 364—424 **10 Claims**



1. For use in a processor-based control system associated with a vehicle, said vehicle having sensors generating signals representative of prescribed conditions of the vehicle, a data handling system comprising:

an electrically erasable and programmable read only memory;

means, coupled to said electrically erasable and programmable read only memory and said sensors, for generating data indicative of a condition of said vehicle in response to signals generated by said sensors and causing said data to be written into said electrically erasable and programmable read only memory;

a control switch, the operation of which governs the operation of said data handling system, wherein said means for generating data comprises means for causing said data to be written into said memory in response to the turning-off of said control switch;

switching means for controlling the supply of power for said electrically erasable and programmable read only memory; and

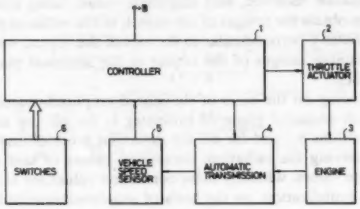
control means, coupled to said switch means and responsive to the operation of said control switch, for causing said switching means to supply power to said electrically erasable and programmable read only memory for a prescribed period of time subsequent to the turning-off of said control switch after which prescribed period of time the supply of power to said memory is cut off.

4,539,642

FAIL-SAFE SPEED CONTROL SYSTEM FOR MOTOR VEHICLES

Yoshikazu Mizuno, and Akira Ikuma, both of Aichi, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 20, 1982, Ser. No. 400,085
Claims priority, application Japan, Jul. 21, 1981, 56-114019
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—426 **9 Claims**



1. A speed control system for a vehicle having an engine, the engine having a speed adjusting element controllable in response to a manual control means, comprising:

a speed sensor for generating a speed signal proportional to the speed of said vehicle;

a speed control means connected to said speed sensor for controlling the setting of said speed adjusting element in response to a speed control signal applied thereto;

manually operated entry means for generating a disabling signal;

monitor means connected to said manually operated entry means for detecting a first condition when said disabling signal is present, said monitor means connected to said speed control means for detecting a second condition when said speed control means is not operating properly, said monitor means generating a first coincidence signal when either said manual disabling signal is present or said speed control means is not operating properly;

coincidence gate means connected to said monitor means and to said speed control means for generating a reset control signal when there is a simultaneous occurrence of said first coincidence signal from said monitor means and a signal from said speed control means; and

bistable means connected to said coincidence gate means for generating a signal for resetting said speed control means in response to said reset control signal from said coincidence gate means; said speed control means including data processing means for performing the steps of:

(a) verifying that said bistable means is operating properly;

(b) if said bistable means is verified, causing said bistable means to switch to the set condition and applying a signal as said second input signal to said coincidence gate means to allow said coincidence gate means to respond to the said first input signal;

(c) deriving a difference signal representing the difference between the speed of the vehicle given by said speed signal and a desired speed and applying the difference signal as said speed control signal to said adjusting element so that the vehicle speed is automatically controlled to said desired speed; and

(d) detecting when said bistable means is in the reset condition; and

(e) repeating the steps (c) and (d) until the reset condition is detected in the step (d), said speed control means being inhibited when said reset condition is detected.

4,539,643

FUEL CUT-OFF CONTROL SYSTEM IN FUEL INJECTION INTERNAL COMBUSTION ENGINE WITH AUTOMATIC POWER TRANSMISSION

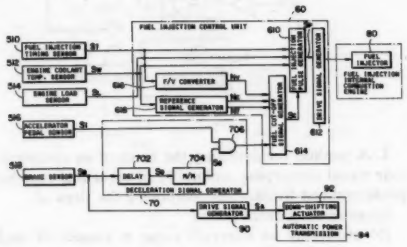
Tadashi Suzuki; Yoshiro Morimoto; Hideo Hamada, all of Yokosuka; Masaaki Suga, and Takashi Murasugi, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 21, 1982, Ser. No. 420,951

Claims priority, application Japan, Oct. 1, 1981, 56-154755; Oct. 9, 1981, 56-160313

Int. Cl.³ G05D *29/00;* **F02D** *33/00;* **F02B** *75/12*

U.S. Cl. 364—431.09 **39 Claims**



1. A fuel cut-off control system for a fuel injection internal combustion engine comprising:

a first means for detecting a released position of an accelerator pedal to produce a first signal;

a second means for deriving the revolution speed of the engine to produce a second signal having a value indicative of said engine revolution speed;

a third means for detecting application of a brake to produce a third signal;

a fuel injection system for controlling fuel injection quantity and fuel injection timing;

fuel cut-off signal generator for producing a fuel cut signal to disable said fuel injection system to cut-off fuel supply to the engine in response to said first signal and including means for selectively comparing said second signal value with a first lower and a second higher threshold values, said fuel cut-off signal generator being operable in either one of a first state in which said comparing means is activated to compare said second signal value with said first, lower threshold value to resume operation of said fuel injection system to resume fuel supply to the engine when said second signal value becomes lower than said first threshold value, a second state in which said comparing means is activated to compare said second signal value with said second, higher threshold value to disable said fuel injection system when said second signal value exceeds said second threshold value, and a third state in which said comparing means is activated to compare said second signal value with said first threshold value to disable said fuel injection system when said second signal value exceeds said first threshold value; and

means for operating said fuel cut-off signal generator in said third state in response to said third signal.

18. In a fuel injection control system for detecting control parameters and producing a fuel injection pulse with a duty cycle corresponding to a determined fuel injection amount and outputting said fuel injection pulse synchronously with the engine revolution,

a method for controlling fuel cut-off comprising:

detecting whether a throttle valve angular position is smaller than a predetermined open angle and producing a first signal in response thereto;

producing an engine speed dependent signal having a value variable depending upon the engine revolution speed;

deriving engine revolution speed on the basis of said engine speed dependent signal value and producing a second signal having a value indicative of the engine revolution speed;

detecting initial application of a brake to produce a third signal;

producing first, lower and second, higher reference signals respectively having values representative of first, lower and second, upper thresholds;

producing a fuel cut-off signal to cut-off fuel supply in response to said first signal;

comparing said second signal value with said first reference signal value in the presence of said fuel cut-off signal and ceasing to produce said fuel cut-off signal when said second signal value becomes less than said first reference signal value;

comparing said second signal value with said second reference signal value in the absence of said fuel cut-off signal and producing said fuel cut-off signal when said second signal value exceeds said second reference signal value;

comparing said second signal value with said first reference signal value in the absence of said fuel cut-off signal and in the presence of said third signal and producing said fuel cut-off signal in response to said third signal when said second signal value exceeds said first reference signal value; and

shifting an automatic power transmission to a lower gear ratio in response to said third signal.

4,539,644

ELECTRONIC TAXIMETER AND CONTROL SYSTEM THEREFOR

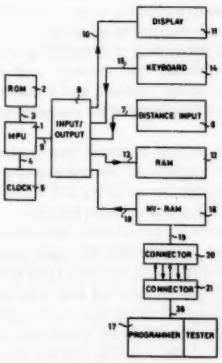
Jürgen Adams, and Hugo Schelling, both of Villingen-Schwenningen, Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Schwenningen, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,448

Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119812

Int. Cl.³ G07B *13/08*

U.S. Cl. 364—467 **15 Claims**



1. A taximeter, comprising:

calculating means responsive to first signals representing time and second signals representing distance,

a store for storing data representing a tariff,

display means for displaying data,

said store and said display means being connected to said calculating means for respectively furnishing data to and displaying data from the calculating means, said calculating means including a microprocessor and said store being a non-volatile read and write memory, and

utilization means for utilizing the non-volatile read-write memory connected to said calculating means to program

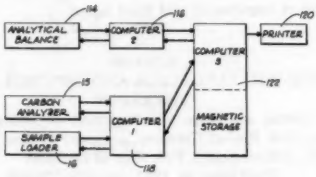
and reprogram the tariff from a source external to the taximeter while maintaining the position of the non-volatile read-write memory and without using the programming capacity of the microprocessor, said utilization means including coupleable and decoupleable connector means and electrical conductors for connecting the connector arrangement to said non-volatile read-write memory.

4,539,645

AUTOMATED SAMPLE ANALYZER FOR INDUCTION FURNACE ANALYSIS

David L. Krottinger, and Dale K. Cabbiness, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Aug. 23, 1982, Ser. No. 410,721
Int. Cl.³ G05B *11/00*; G01N *33/00*
U.S. Cl. 364—478 **11 Claims**



1. An automated sample analyzer for induction furnace analysis comprising:

an induction furnace having an induction coil housing with a lower opening and an induction coil located therein to and from which a crucible with a sample therein can be moved through said lower opening;

elevator means for raising and lowering a crucible to and from said induction coil through said lower opening, including a crucible pedestal and a cover extending beneath said crucible pedestal for covering said lower opening;

a rotatable and radially movable tray disposed adjacent to said elevator means and having a plurality of crucible recetacle openings for receiving and holding crucibles and radially receiving said crucible pedestal;

tray moving means for rotationally and radially moving said tray in a series of steps such that said crucible receptacle openings are sequentially moved to and from said crucible pedestal for sequential loading and unloading of crucibles on said crucible pedestal, said tray moving means including a radial moving means for alternately radially moving a selected one of said crucible receptacle openings in said tray to said crucible pedestal and beneath said lower opening and radially moving said tray away from said crucible pedestal and said lower opening, said tray moving means also including an indexing means, for rotationally advancing said crucible receptacle openings one receptacle opening at a time; and

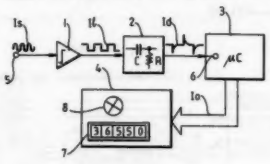
control means for controlling said tray moving means, said elevator means and said induction furnace to sequentially and cooperatively raise and lower crucibles to and from said crucible receptacle openings in said tray, raise and lower crucibles to and from the said induction coil and analyze by induction furnace analysis samples in said crucibles when disposed in said induction coil.

4,539,646

TONE DETECTION ARRANGEMENT

Paul J. Stein, Blindley Heath, and Rodney W. Gibson, Burgess Hill, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,635
Claims priority, application United Kingdom, Mar. 18, 1981, 8108450
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—484 **7 Claims**



1. A method for detecting the tones of an electrical multi-tone signal comprising a plurality of sequential tone bursts of predetermined frequencies comprising the steps of:

(a) generating clock pulses;

(b) producing an interrupt pulse in respect of each zero crossing in at least one sense of the multi-tone signal;

(c) counting the number of clock pulses occurring in the period between each interrupt pulse and the preceding interrupt pulse to produce a first number which is representative of this measured period;

(d) comparing said first number with predetermined numbers which are respectively representative of the periods of all the different possible tone frequencies which the multi-tone signal can have, to obtain a tentative detection of the particular tone frequency to which said measured period corresponds;

(e) generating in respect of each tentative detection of a tone frequency a number count commencing with a selected number, and thereafter incrementing the relevant number count by a given number each time the tentative detection of the tone frequency concerned is obtained;

(f) after incrementing a number count, comparing it with a threshold number to obtain a confirmed detection of the tone frequency concerned when the number count exceeds said threshold number;

(g) decrementing by a fixed fraction the values of the number counts subsisting in respect of all of the tone frequencies, after each comparison of any number count with said threshold number in which the threshold number is not exceeded;

(h) providing a recognition of the multi-tone signal when a confirmed detection of all of the tone frequencies thereof in succession has been obtained.

4,539,647

METHOD OF AND APPARATUS FOR IDENTIFYING PRESENSITIZED OFFSET PRINTING PLATES

Sinobu Kaneko, and Hiroyuki Nakade, both of Osaka, Japan, assignors to Kotobuki Seihan Printing Co., Ltd., Osaka, Japan

Filed Sep. 14, 1982, Ser. No. 418,037
Claims priority, application Japan, Sep. 17, 1981, 56-146872
Int. Cl.³ G02F *3/46*
U.S. Cl. 364—526 **2 Claims**

1. A method of identifying a presensitized offset printing plate with a photosensitive layer thereon comprising the steps of

(a) scanning the photosensitive layer on said presensitized plate to be tested with a white light along a path;

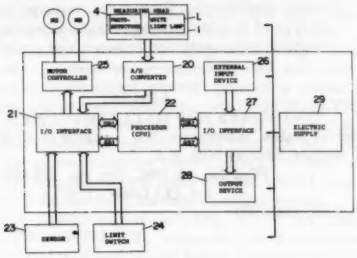
(b) detecting the light reflected from a plurality of spots along the scanned path in each of four color bands to

derive a magenta signal, yellow signal, cyan signal and back-and-white signal;

(c) measuring in said four color signals the intensity levels of the reflected light from respective spots on said scanned path to calculate mean values as well as variance values with respect to each of the four colors;

(d) recognizing the calculated mean values and variance values as test data characteristic to said plate to be tested;

(e) incorporating said test data into each of a plurality of sets of reference data to form corresponding numbers of groups, each set of reference data being composed of the intrinsic mean values and variance values obtained with



respect to said four colors for each of a number of known plates having different light reflective characteristics;

(f) calculating correlation ratios with respect to said four colors for each group so as to get the sum of the correlation ratios therefor; and

(g) comparing the sum of the correlation ratios among said groups to find the group having a minimum value of said sum such that the test data is determined to be substantially identical to the particular reference data which forms with the test data said group having the minimum value and therefore that the plate to be tested is identified as one of the reference plates.

4,539,648

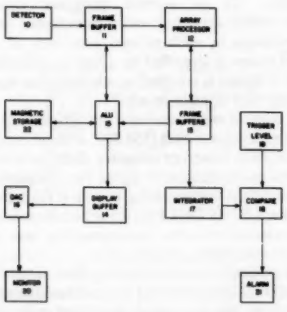
DETECTION OF AGRICULTURAL CONTRABAND IN BAGGAGE

Thomas F. Schatzki, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 426,440

Int. Cl.³ G01N *23/00*; H04N *5/20*

U.S. Cl. 364—555 **19 Claims**



1. In a radiant energy imaging system, a method for distinguishing objects having circular cross section from objects having rectangular cross section, such objects being contained in a material having a different density-absorption coefficient product than the objects, comprising:

(a) directing a beam of radiant energy through the objects;

(b) measuring transmitted intensity of the radition while maintaining spatial resolution;

(c) calculating a spatial gradient image of the transmitted intensity;

(d) eroding the gradient image one or more times to preferentially remove edges of images of objects having rectangular cross section relative to edges of images of objects having circular cross section, said objects being contained in a material having a different density-absorption coefficient product than said objects; and

(e) presenting the image of step (d).

4,539,649

METHOD AND APPARATUS FOR THE GAMMA TRANSMISSION ANALYSIS OF MULTICOMPONENT MIXTURES IN THE PRESENCE OF COARSE GRAINED COMPONENTS

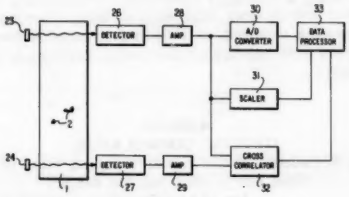
Walfried Michaelis, Seevetal; Hans-Ulrich Fanger, Reinbek, and Hans L. The, Hamburg, all of Fed. Rep. of Germany, assignors to GKSS-Forschungszentrum Geesthacht GmbH, Geesthacht, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,896

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138159

Int. Cl.³ G06F *15/46*; G01F *1/00*

U.S. Cl. 364—558 **17 Claims**

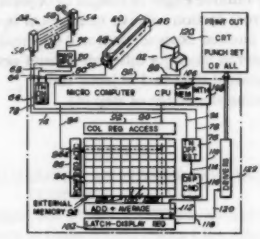


1. Method for determining the average density or volume percentage of at least one coarse grained component of a multicomponent mixture by gamma transmission analysis, including the steps of irradiating the mixture with gamma radiation from at least one source, detecting the transmitted radiation by means of at least one detector, and evaluating a selected relation between the transmitted and detected radiation intensities to determine the average density or volume percentage by using a first transmission equation which defines the selected relation as a function of the average density or volume percentage in homogeneous mixtures, said step of evaluating comprising transforming the value of the selected relation resulting from solving the first equation with the aid of a correction function which is derived by comparison of corresponding values in the first transmission equation and in a further transmission equation which defines the selected relation as a function of the particle sizes of the coarse grained component in order to provide a corrected determination relative to that component.

4,539,650
MASS CALCULATING AND INDICATING MEANS FOR WEIGHING MOVING VEHICLES

Thomas D. Griffin, 11707 LaMon St., Alsip, Ill. 60659, and Peter S. Kopala, 638 N. Marion, Oak Park, Ill. 60302

Filed Nov. 24, 1980, Ser. No. 209,610
Int. Cl.[3] G01G *9/00, 19/03*
U.S. Cl. 364—567 14 Claims



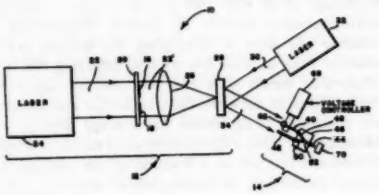
1. A device for calculating the weight of a load, comprising,
an impact sensor unit including a bladder adapted for travel of the load thereover, and a transducer operable for producing a signal by the flexure of the bladder caused by a load passing thereover, and in proportion to the extent of said flexure,
a speed sensor operable for producing a signal, in response to sensing the speed of the load passing over the impact sensor unit, corresponding with the speed of the load so passing, and
computer means operable for sensing said two signals and utilizing them and thereby producing a specific signal indicating the weight of the load.

12. In a system for determining the weight of a vehicle in motion, the system responding to the vehicle impact for measuring pressure, a radar unit for measuring vehicle speed and a microprocessor including a memory having data stored therein which relate pressure and speed to weight, a method comprising the steps: generating a first signal corresponding to pressure, as a first memory address; generating a second signal corresponding to speed, as a second memory address; and reading out from memory a value which corresponds to vehicle weight.

4,539,651
OPTICAL CORRELATOR

Jacques E. Ludman, 98 Old Lowell, Westford, Mass. 01731

Filed Feb. 9, 1983, Ser. No. 465,227
Int. Cl.[3] G06G *9/00*
U.S. Cl. 364—822 10 Claims

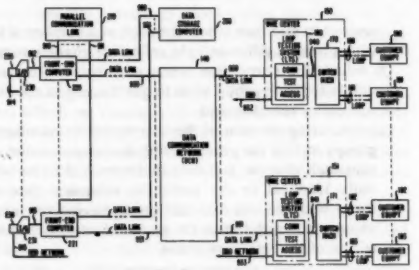


1. An optical correlator comprising:
means for comparing a pair of optical signals and providing a readout beam formed of a plurality of components, each of said components having wavefronts associated therewith and varying in intensity representative of said optical signals; and
means for detecting said wavefronts of said components of said readout beam in order to establish a correlation between said optical signals, said detecting means including:
a pair of optical fibers optically interposed within said readout beam, each of said optical fibers having substantially the same optical path length,
means optically associated with said pair of optical fibers for combining said optical fibers to form a single optical output path,
means operably associated with one of said optical fibers for varying the effective optical path length of said one optical fiber, and
means optically aligned with said optical output path for detecting periodic variations in intensities of said wavefronts of said components of said readout beam;
whereby, conventional Fourier spectroscopy techniques can be applied to said detected periodic intensities in order to establish said correlation between said optical signals.

4,539,652
NETWORKS FOR DATA COMMUNICATION

Harvey Rubin, Morristown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,180
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—900 1 Claim



1. A bus connection system (**141,1421–1432,145,140-01–14096**) for connecting a plurality (M) of input busses (**14101–14103**) having a message format to a plurality (N) of output busses (**93001–93768**) having a data format, said system comprising
a plurality (I) of first program control means (**1421–1432**), each identified by a logical identifier (L_2=0, 1, . . . , I-10) and associated with an interface bus having a communication format (e.g., GPIB),
a plurality (J) of second program control means (**14001–14096**) arranged into a preselected number (I) of sets, wherein in each of said sets each of said second control means is identified by a logical identifier (L_3=0, 1, . . . , N/J-1) and is coupled to said interface bus of a corresponding first control means,
said first control means and said second control means each having processor means (**550,570**) with accessible memory (**520,530,540**), interrupt circuitry (**510**) including an interrupt processing routine to signal the completion of events and a multitasking operating system (OS) including a task scheduler (SCHEDULER) for scheduling, according to a predetermined priority, corresponding task issuing as a result of said event completions,
said first control means including first input bus control means (**710,720**), connected to one of said input busses and serviced by its associated identified task scheduler in response to its associated interrupt processing routine, for receiving and storing said messages (INFORMATION fields) in an area of its associated memory assigned to said one of said input busses whenever said messages ('dow-

n_route') contain said identifier assigned to said each of said first control means, for augmenting said stored messages with routing parameters ('up_route') identifying which of said input busses transmitted said received messages and for signaling message-complete events,

said first control means including first interface bus control means (620'), connected to said interface bus and serviced by its associated task scheduler in response to its associated interrupt processing routine, for storing communications (INFORMATION fields) received over said interface bus in a memory location determined by parameters ('up_route') in said communications, for transmitting each of said augmented messages over said interface bus and for signaling message-complete events,

said first input bus control means including means (710,720) for transmitting communications from each said memory location over the associated one of said input busses,

said second control means including second input means (710',720'), serviced by its associated task scheduler in response to its associated interrupt processing routine for receiving and storing communications (INFORMATION fields) arriving over said interface bus in an area of its associated memory assigned to said interface bus whenever said communications ('down_route') contain said identifier assigned to said each of said second control means and for signaling message-complete events,

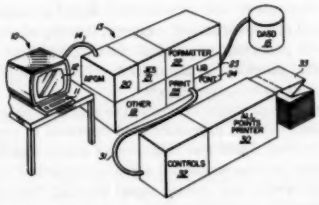
said second control means including output bus control means (761–768,751–753), connected to a preselected numbeer (N/J) of said output busses and serviced by its associated task scheduler in response to its associated interrupt processing routine, for storing data (INFORMATION fields) received over each of said preselected output busses in a memory location determined by parameters ('up_route') in said data, for transmitting said communications from said assigned memory over the corresponding one of said preselected output busses identified by routing parameters ('down_route') in each of said communications and for signaling message-complete events,

said second interface bus control means including means (710',720') for transmitting data from each said corresponding location in memory over said interface bus.

4,539,653
FORMATTING TEXT/GRAPHICS USING PLURAL INDEPENDENT FORMATTING MECHANISMS

Geoffrey M. Bartlett, Ridgefield, Conn.; James P. Hofmeister, and Edward J. Pring, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 11, 1983, Ser. No. 484,032
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **62 Claims**



1. In an automatic typographic page formatter having means to receive coded text digital signals, including means to receive formatting commands with said text signals, and formatting means coupled to said receiving means for formatting a page of text using said received text digital signals and in accordance with said received formatting commands;

the improvement including in combination:

first means in said formatting means coupled to said receiving means and being capable of receiving said text digital signals and said formatting commands for assigning said received text digital signals to successive pages of text and indicating ending formatting of each page whereby a document having a plurality of pages of text can be created from said received text digital signals;

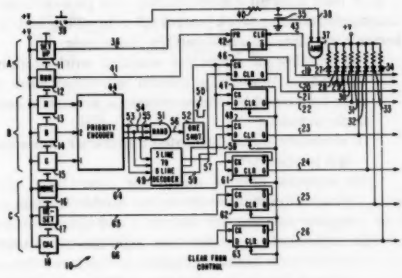
said first means including format limiting means for sequentially placing text on each of said successive pages such that successively vertical portions of each page sequentially receive text; and

named area control means coupled to said first means and said receiving means for sequentially receiving said text digital signals and said formatting commands and being responsive to named area ones of said formatting commands to select predetermined ones of said text digital signals for insertion onto predetermined ones of said pages of text independently of said first means and said sequence of receipt whereby text inserted by said named area means has a format and page location independent of the said first means sequentially created text format and the sequence of receipt of said text digital signals.

4,539,654
SWITCH ARRANGEMENT FOR ACCESSING A COMPUTER

Craig E. Deyer, Akron, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 28, 1982, Ser. No. 402,546
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—900 **12 Claims**



1. In a switch arrangement for providing access to a computer including a plurality of individually actuatable switches, an improvement comprising:

a first group of switches, first output means responsive to the switches in said first group for continuously providing an access signal, said output means having a plurality of output lines equal in number to the number of switches in said first group and being arranged whereby said access signal is selectively available on one of said output lines, in accordance with the selective actuation of said switches;

a second group of switches, second output means responsive to the switches in said second group, said second output means having a plurality of output lines individually connectable to particular individual switches of said second group of switches, said second output means including priority assignment means whereby the simultaneous actuation of more than one switch of said second group of switches sequentially connects said output lines to said switches in accordance with the priority assignment by said second output means;

a third group of switches, third output means responsive to the switches in said third group and having a third plurality of output lines individually connectable to the switches of said third group whereby an access signal is available

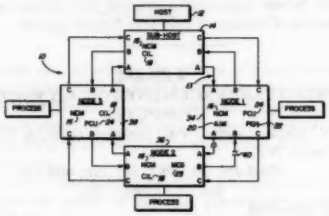
on a particular one of said third output lines when a particular one of said third switches is actuated.

4,539,655

MICROCOMPUTER BASED DISTRIBUTED CONTROL NETWORK

Gerald C. Trussell, Laveen; Andre B. Felix, Tempe; Thomas D. Hembree, and Paul F. Rollins, both of Phoenix, all of Ariz., assignors to Phoenix Digital Corporation, Phoenix, Ariz.

Filed Mar. 16, 1982, Ser. No. 358,718
Int. Cl.³ H04J 3/08
U.S. Cl. 364—900 **18 Claims**



1. A fault tolerant distributed network process control and communications network system for controlling and/or monitoring a plurality of work stations comprising:

(a) a plurality of nodes for selected work stations each adapted to monitor or control individual work stations inter-connected by communications network means, each node including:

(i) processor means dedicated to network communication and process I/O;

(ii) network control means for controlling inter-node protocol communications and further including clocking means and error detection and correction means;

(iii) communications interface logic means for interfacing between the communications network and the network control means and further including clocking means and error correction and detection means for reshaping and resynchronizing the transmitted signal at each communication interface logic means;

(b) said communications network means interconnecting said network node and said plurality of nodes; said network communication means having two primary channels (A and B) in a first communications media which operate to simultaneously transmit data between the said nodes in opposite directions and a third back-up channel (C) which is normally on standby;

(c) said communications interface logic means upon failure of channel A or B being operable to switch to the other of channel A or B and channels A and B will fold back on themselves with data also being transmitted on the non-failed channel A or B, whereby transmitted data will pass through all nodes in the network regardless of message destination;

(d) said network control means and said communications interface logic means upon failure of channels A and B being operable to switch to channel C; and

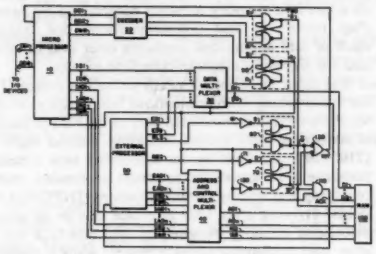
(e) said communications interface logic means including means continually monitoring channels A, B and C whereby upon fault correction, said error detection and correction means prioritize communications to channel A.

4,539,656

MEMORY ACCESS SELECTION CIRCUIT

Robert J. Abrant, Villa Park, Ill., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Nov. 1, 1982, Ser. No. 438,083
Int. Cl.³ G06F 9/46, 13/06
U.S. Cl. 364—900 **9 Claims**



1. A memory access selection circuit in a computer system including an external processor, operated to provide external read and write signals, request and release signals, and further operated to transmit external data in association with said external write signal, said memory access selection circuit comprising:

an internal processor operated to provide internal read and write signals, and further operated to transmit internal data in association with said internal write signal, and further operated to provide enable, disable and first and second select signals;

a memory operated to transmit memory data in response to said enable signal and said internal or external read signal and further operated to receive said internal or external data in response to said internal or external write signal, respectively, and said enable signal;

said internal and external processors each further operated in response to said internal or external read signal respectively, to receive said memory data;

multiplexing means connected to said internal and external processors and said memory, and operated in response to said first select signal to connect said external processor to said memory, thereby allowing said external processor to transmit data to, and receive data from, said memory, in association with said external write and read signals, respectively, said multiplexing means further operated in response to said second select signal to connect said internal processor to said memory, thereby allowing said internal processor to transmit data to, and receive data from, said memory, in association with said internal write and read signals, respectively;

first storage means connected to said external processing and said internal processor, and operated in response to said request signal and said second select signal to provide a first service-requested signal and further operated in response to said release signal and said first select signal to provide a second service-requested signal; and

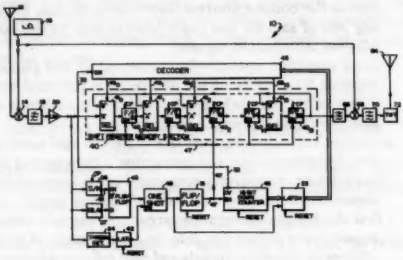
an OR gate connected to said storage means and operated in response to said first or second service-requested signal to provide an interrupt signal;

and said internal processor operated in response to said interrupt signal and said first select signal to provide said second select signal and further operated to response to said interrupt signal and said second signal to provide said first select signal.

4,539,657
MEMORY SYSTEM

Robin P. Nicholls, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 6, 1983, Ser. No. 529,319
Int. Cl.³ G11C *27/00*
U.S. Cl. 365—45 **4 Claims**



1. Apparatus for storing a periodic signal and for recycling complete cycle portions of such stored periodic signal is provided, such apparatus comprising:

means for converting an input sinusoidal signal into a corresponding first train of pulses;

means for producing a second train of pulses repre-sentative of samples of the input sinusoidal signal;

means for producing a signal related to the difference in time between the leading edge of the first train of pulses and the leading edge of the second train of pulses to provide a control signal related to a time interval between a first time such time difference is less than a predetermined value and a second later time such time difference is less than such predetermined value;

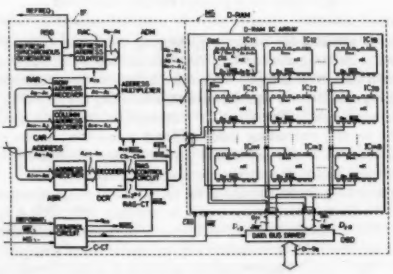
storage means; and

means, responsive to the control signal, for recycling complete cycles of the first train of pulses through the storage means.

4,539,658
SEMICONDUCTOR MEMORY

Katsuhiro Shimohigashi, Murashimurayama; Hiroo Masuda, Kodaira; Kunihiko Ikuzaki, Tokyo, and Hiroshi Kawamoto, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 377,958, May 13, 1982,. This application Aug. 8, 1984, Ser. No. 638,982
Claims priority, application Japan, May 13, 1981, 56-70733
Int. Cl.³ G11C *11/40*; H01L *29/78*
U.S. Cl. 365—207 **1 Claim**



1. A semiconductor memory comprising:

a plurality of pairs of data lines;

differential amplifiers, each of which amplifies a difference between signal levels appearing on each pair of data lines;

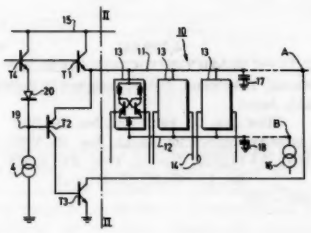
word lines, each of which is arranged so as to intersect with each pair of data lines; and

precharging circuits, each of which sets each pair of data lines at a potential intermediate between binary signal levels to be stored in memory cells, before operation of the corresponding differential amplifier is started.

4,539,659
SEMICONDUCTOR MEMORY HAVING A DYNAMIC DISCHARGE CIRCUIT

Daniel Dumont, Douvres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1983, Ser. No. 469,536
Claims priority, application France, Feb. 26, 1982, 82 03237
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—226 **4 Claims**



1. A semiconductor memory comprising memory cells which are arranged in a matrix of rows and columns, each memory cell comprising two emitter-connected transistors whose collectors are cross-wise connected to the bases, the memory cells in a matrix row being connected parallel to one another between a first and a second power supply line, switching means being connected to the first power supply line in order to bring the first power supply line to a line selection potential or to a rest potential, a current source being connected to the second power supply line in order to sustain data stored in each memory cell connected to said line, said switching means comprising a first transistor which is connected to the first power supply line by way of its emitter and whose base receives voltage pulses in order to bring the first power supply line to the line selection potential and also comprising a further transistor for the discharging of the first power supply line from the line selection potential to the rest potential or for the discharging of the second power supply line, said memory also comprising detection means for detecting the end of a voltage pulse on the base of the first transistor and for controlling the further transistor, said detection means being at least indirectly connected to the base of the first transistor for this purpose, characterized in that the detection means comprise a second transistor whose emitter is connected to the first power supply line and whose base is at least indirectly connected to the base of the first transistor, the further transistor being controlled via the collector of the second transistor, the first and the second transistor being of a first and a second conductivity type, respectively.

4,539,660

SEMICONDUCTOR INTEGRATED CIRCUIT

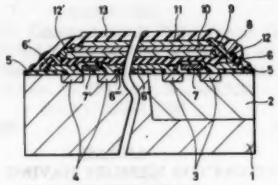
Katsuki Miyauchi, Hino; Tetsuichi Kudo, Tokyo; Osamu Minato, Kodaira; Toshiaki Masuhara, Tokyo, and Yoshio Uetani, Ibaragi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Maxell, Ltd., Ohsaka, both of, Japan

Filed Dec. 16, 1981, Ser. No. 331,278

Claims priority, application Japan, Dec. 26, 1980, 55-188723

Int. Cl.³ G11C *11/34*

U.S. Cl. 365—229 **22 Claims**



1. A semiconductor integrated circuit comprising an integrated circuit chip including a memory part in which a plurality memory elements or memory circuits are arrayed, and at least one power supply element carried with said integrated circuit chip and connected to power supply terminals of said integrated circuit chip.

4,539,661

STATIC-TYPE SEMICONDUCTOR MEMORY DEVICE

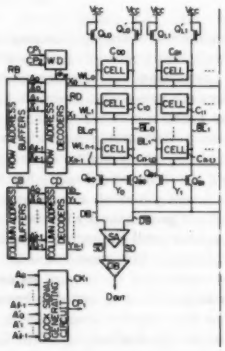
Atushi Oritani, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1983, Ser. No. 508,505

Claims priority, application Japan, Jun. 30, 1982, 57-111519; Jun. 30, 1982, 57-111523; Jun. 30, 1982, 57-111535

Int. Cl.³ G11C *19/40, 8/00*

U.S. Cl. 365—230 **7 Claims**



1. A static-type semiconductor memory device operatively connectable to receive row address and column-address information signals, comprising:

first and second power supply terminals;

a plurality of word lines;

a plurality of pairs of bit lines intersecting said plurality of word lines;

a plurality of load means, each of said plurality of load means operatively connected to one of said bit lines and to said first power supply terminal, for charging said plurality of pairs of bit lines;

a plurality of static memory cells, each of said plurality of static memory cells operatively connected to one of said word lines and to one of said pairs of bit lines;

row-addressing means, operatively connected to said word lines and operatively connected to receive the row-address information signals, for selecting one of said word lines upon receipt of the row-address information signals;

column-addressing means, operatively connected to said plurality of bit line pairs and operatively connected to recive the column address information signals, for selecting one of said bit line pairs upon receipt of the column-address information signals;

a sense amplifier, operatively connected to said plurality of bit lines, for amplifying the difference in potential between a pair of bit lines selected by said column-address means and providing an output potential;

an output buffer, operatively connected to said sense amplifier, for maintaining and outputting a data output signal;

a word driver, operatively connected to said row-addressing means, for activating said row-addressing means;

a first clock signal-generating circuit, operatively connected to said word driver, for detecting the change of said row-address information signals and said column-address information signals and generating a first clock signal, the rise of said first clock signal setting said word driver; and

a second clock signal-generating circuit, operatively connected to said plurality of word lines and said word driver, for detecting the change of the potential of said word lines and generating a second clock signal, the rise of said second clock signal resetting said word driver.

4,539,662

METHOD AND SYSTEM FOR OPTICALLY RECORDING AND PLAYING BACK INFORMATION ON A RECORDING MEDIUM HAVING MAGNETIZATION FILM THEREON

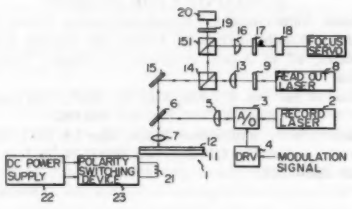
Hideki Hatano; Norikiyo Tajiri; Sakashi Otaki, and Shigeru Kato, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,243

Claims priority, application Japan, Jun. 4, 1981, 56-086152

Int. Cl.³ G11B *11/10*

U.S. Cl. 369—13 **6 Claims**



1. A method for recording, playing back and erasing information utilizing a recording medium having a vertical magnetization film on and from which the information is recorded and having readout by optical means, including a recording beam and a playback beam, means for applying a weak magnetic field on the recording medium, and a tracking servo system operated by a control signal produced by a reflection of the playback beam, the method comprising the steps of:

recording the information on the vertical magnetization film to form a recording track, in manner such that a spot of the recording beam is applied, in accordance with the information to be recorded, on the vertical mangetization film whose magnetization orientation is previously unified in a first direction, under the application of the weak magnetic field having a second direction reverse from said first direction;

reproducing the recorded information and erasing desired

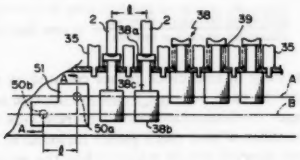
portions of the recorded information by applying the recording beam on desired portions of the recording track under the application of the weak magnetic field whose magnetic orientation is in said second direction; and

operating the tracking servo at the time the erasing operation is performed so that the recording beam is applied in registry with the original said recording track, thereby erasing the desired portions of said recording track subsequent to the reproduction of the information recorded thereon, and forming new recording tracks accurately on the initial recording track by the operation of tracking servo system.

4,539,663
DISC PLAYING SYSTEM WITH CONTINUOUS PLAYING FUNCTION

Masaya Ishibashi; Atuki Tada, and Jun Kanda, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 10, 1984, Ser. No. 639,471
Claims priority, application Japan, Aug. 12, 1983, 58-147827
Int. Cl.³ G11B *17/02, 17/28, 17/30*
U.S. Cl. 369—34 **1 Claim**



1. A disc playing system for playing selected ones of a plurality of stored discs in succession, comprising:

disc storing part having a plurality of slots for receiving a disc which are juxtaposed in a predetermined direction with a predetermined pitch, where a sequential number is assigned to each of said slots;

a detection means for detecting whether or not a disc is present in each of said slots; and

a memory means for memorizing the number of vacant slots in accordance with an output signal from said detection means, wherein said detection means includes a plurality of members movably provided in each of said slots and to be shifted when a disc is put in the slot, and a sensor means movably disposed along said direction of arrangement of slots for in turn detecting the position of each of said members.

4,539,664
CONTROL SYSTEM FOR OPTICAL INFORMATION SIGNAL REPRODUCTION DEVICE

Masahiro Deguchi; Mitsuro Moriya; Noboru Wakami; Yasuhiro Goto, and Kazuharu Shiragami, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

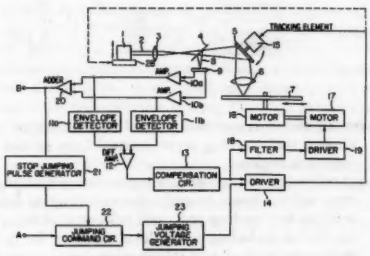
Continuation-in-part of Ser. No. 309,461, Oct. 7, 1981, abandoned, which is a continuation of Ser. No. 69,331, Aug. 24, 1979, abandoned. This application May 20, 1982, Ser. No. 380,343
Claims priority, application Japan, Aug. 25, 1978, 53-104038; Aug. 25, 1978, 53-104039
Int. Cl.³ G11B *7/00, 21/08*
U.S. Cl. 369—44 **8 Claims**

1. A control system for an optical information reproduction device which reproduces information recorded on spiral or circular information signals tracks produced on a recorded medium comprising:

(a) a transducer means for reproducing information signals recorded on said tracks produced on said recorded medium, said transducer means comprising a light source, an optical system for focusing a light beam emitted from said light source on said recording medium, and a sensing element for reading by sensing the light beam reflected back from said track and identifying a desired signal track at which the light beam from the light source is being focused and reading out the information recorded thereon,

(b) a tracking control means for controlling the scanning positon of said transducer means so as to follow the desired track, for the purpose to reproduce the information recorded on said desired track, said tracking control means comprising a tracking actuator for changing the position on which said light beam is focused on said record medium, and a control circuit for controlling said tracking actuator in response to the signal from said transducer means which detects the relative positional relationship between said light beam focused on said recorded medium and said signal track,

(c) a track jumping command generating means for generating a track jumping commencement signal,



(d) a signal generating means for generating signals including a gradually increasing signal portion for driving said tracking actuator so that the light beam focused on said record medium can be displaced substantially at the same velocity in the direction substantially perpendicular to said signal track,

(e) a track detecting means for detecting whether or not said displaced light beam has been brought adjacent a desired signal track,

(f) a brake signal generating means for generating said brake signal to decelerate the displacement speed of said light beam displaced by said tracking actuator, whereby said signal generating means is operated in response to said track jumping commencement signal generated by said track jumping command generating means, said tracking actuator is driven in response to said track jumping commencement signal generated by said track jumping command generating means, and said brake signal generating means is controlled in response to the output of said track detecting means.

4,539,665
TRACKING SERVO CONTROL UNIT FOR AN INFORMATION REPRODUCING APPARATUS

Yoshimi Iso, Yokohama; Shigeki Inoue, Toyokawa; Tsutomu Noda, Yokohama, and Shinichi Ohashi, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1983, Ser. No. 468,190
Claims priority, application Japan, Feb. 22, 1982, 57-26004
Int. Cl.³ G11B *7/00, 21/10*
U.S. Cl. 369—44 **7 Claims**

1. In an information reproducing apparatus having tracking servo control loop for causing an information reading unit, including means for detecting a tracking error signal for tracking an information bearing track on a disc, to track said information bearing track in accordance with said tracking error

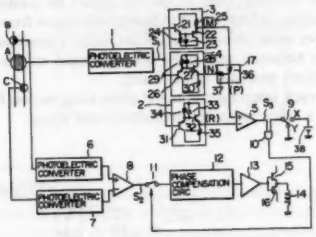
signal to reproduce information in accordance with an information signal read by said information reading unit,

a tracking servo control unit for said information reproducing apparatus comprising;

voltage generation means for generating a voltage corresponding to said information signal read by said information reading unit;

reference voltage generating means;

a compare circuit for comparing the output of said voltage generation means with the output of said reference voltage generating means to produce a discrimination signal to discriminate a negative feedback region of said tracking error signal; and



control means responsive to said discrimination signal for closing said tracking servo control loop in said negative feedback region;

said reference voltage generating means generating a reference voltage based on said information signal read by said information reading unit, said reference voltage generating means including a first level detector for detecting a maximum level of said information signal, a second level detector for detecting a minimum level of said information signal, and an adder for adding the output of said first level detector and the output of said second level detector to produce said reference voltage representative of an intermediate level between the maximum level and the minimum level of an envelope of said information signal.

4,539,666

APPARATUS FOR CONTROLLING ROTATION OF A RECORD DISK AT A CONSTANT LINEAR VELOCITY

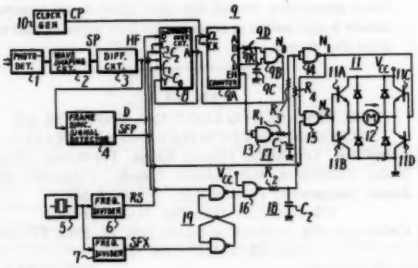
Shigeaki Wachi, Higashikurume, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 13, 1982, Ser. No. 433,951

Claims priority, application Japan, Oct. 13, 1981, 56-163128

Int. Cl.³ G11B *23/00, 27/10, 7/00*

U.S. Cl. 369—50 **12 Claims**



1. Apparatus for reproducing from a record medium an information signal of the type including at least one frame of data and at least one transition interval such that maximum and minimum limits are provided for said at least one transition interval and correspond to maximum and minimum transition intervals, and at least one maximum transition interval is provided in each frame of data, said frame of data having a frame period corresponding to the length of time for reproducing said frame of data at a predetermined constant linear velocity, said apparatus comprising:

transducer means for reproducing said information signal from said record medium during relative movement between said transducer means and said record medium;

means for producing an output signal at a bit frequency and corresponding to said reproduced information signal, said output signal having portions of opposite polarities so that said output signal includes at least one transition interval;

clock pulse generating means for generating clock pulses having a constant frequency higher than the bit frequency of said output signal;

detecting means for detecting the length of at least one transition interval of said output signal by counting the number of said clock pulses generated during each detected transition interval of said output signal;

determining means for determining, during each of at least one predetermined period selected to be longer than the period

$$\frac{\text{maximum transition interval}}{\text{minimum transition interval}} \times \text{one frame period},$$

if the number of said clock pulses counted by said detecting means during each detected transition interval in each respective longer predetermined period corresponds to a predetermined number of said clock pulses included in the maximum transition interval which occurs when the record medium is moving at said predetermined constant linear velocity with respect to said transducer means, and for producing a velocity control signal in response thereto; and

velocity control means for controlling movement of said record medium at said predetermined constant linear velocity with respect to said transducer means in response to said velocity control signal.

4,539,667

DISC PLAYERS

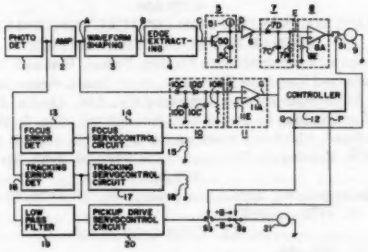
Kazuhiko Fujiie, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 5, 1982, Ser. No. 439,585

Claims priority, application Japan, Nov. 10, 1981, 56-180172

Int. Cl.³ G11B *19/24*

U.S. Cl. 369—50 **6 Claims**



1. A disc player for reproducing an information signal digitally modulated in the form of a run length limited code, having predetermined maximum and minimum run time lengths, recorded with constant recording density in a spiral track on a disc, said disc player comprising:

driving means for rotating said disc;

pickup means for scanning said spiral track on said rotating disc and reproducing the signal recorded therein;

first detecting means receiving the reproduced signal from said pickup means for detecting a first time interval of constant signal level representing one of said maximum and minimum run time lengths and providing a drive control signal having a level varying in response to the detected length of said first interval;

means connected to said driving means and receiving said drive control signal for changing an operating mode of said drive means, whereby said driving means is operated to maintain a predetermined constant length of said first time interval corresponding to a selected scanning speed of said pickup means relative to said disc;

second detecting means receiving said reproduced signal from said pickup means for detecting when a second time interval of constant signal level in said reproduced signal exceeds a predetermined maximum time interval representing said maximum run time length at said selected scanning speed and providing an overspeed control signal in response thereto; and

controller means response to said overspeed control signal for producing a mode signal fed to said means for changing an operating mode of said drive means, whereby the operating mode of said driving means is changed.

4,539,668

DEVICE FOR LOADING AND EJECTING A DISC IN A DISC PLAYER

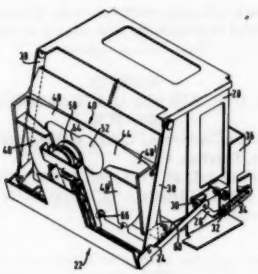
Yutaka Izumi, and Hiroshi Kawakami, both of Fujisawa, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 17, 1982, Ser. No. 419,408

Claims priority, application Japan, Sep. 18, 1981, 56-146293

Int. Cl.³ G11B *17/04, 1/04*

U.S. Cl. 369—75.2 **8 Claims**



1. A device integral with a disc player for loading and ejecting a disc in the disc player comprising:

chassis means; and

means for carrying said disc, said carrying means being attached to said chassis means and including a first wall having a first pair of surfaces for receiving said disc which are other than parallel and are disposed about a center plane, said center plane being, aligned orthogonally to the plane of said disc during loading and parallel to the direction of loading, so that only peripheral edge portions of said disc contact said first pair of surfaces.

4,539,669

FRONT-LOADING RECORD PLAYER

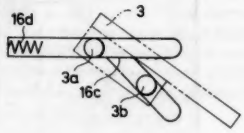
Tsutomu Miyakawa; Junji Yamane; Masahiro Takagi; Tomoyoshi Arai; Haruhiko Tanaka; Yuji Morita, and Satoshi Sakurai, all of Saitama, Japan, assignors to Pioneer Electric Corporation, Tokyo, Japan

Filed Jan. 17, 1983, Ser. No. 458,590

Claims priority, application Japan, Jan. 18, 1982, 57-4845

Int. Cl.³ G11B *17/04, 23/02*

U.S. Cl. 369—75.2 **10 Claims**



1. A front-loading record player comprising:

a slide base (1) carrying thereon a turntable (4) and movable back and forth in a direction with respect to a player cabinet, said player cabinet having a front door;

driving cam means (9) including a front slant retainer section (9*b*) and a rear linear section (9*a*), said linear section extending in parallel with the moving direction of said slide base and said driving cam means being provided on said slide base;

guide cam means (8) including a front recess portion (8*b*) and a rear linear portion (8*a*), said linear portion extending in parallel with the moving direction of said slide base and said guide cam means being provided on said player cabinet,

a front door opening/closing drive member (10) for opening and closing said front door (3) of said player cabinet, said drive member being held between said driving cam means (9) and said guide cam means (8); and

means (11, 12, 13) for drivingly coupling said front door opending/closing drive member (10) and said front door to each other,

wherein said front door opening/closing drive member (10) is driven back and forth and held between said front slant retainer section of said driving cam means (9) and said rear linear portion of said guide cam means (8) when said slide base (1) is located behind a predetermined position whereas said front door opening/closing drive member (10) is held at a standstill between said linear section of said driving cam means (9) and said recess portion of said guide cam means (8) when said slide base (1) is located in front of said predetermined position.

4,539,670

AUTOMATIC DISC LOADING APPARATUS

Shizuo Inaba; Kiyoshi Sato; Yoshio Takahashi, and Hideyuki Takahashi, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,785

Claims priority, application Japan, Dec. 9, 1981, 56-198285; Dec. 9, 1981, 56-198291; Dec. 9, 1981, 56-198301

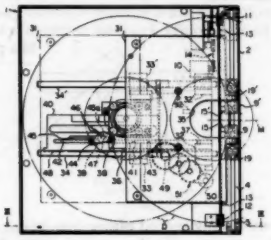
Int. Cl.³ G11B *25/04, 3/00*

U.S. Cl. 369—77.1 **14 Claims**

1. In a disc player having a casing structure provided with a record disc insertion slot, a turn-table assembly, a pick-up assembly associated with said turn-table assembly for playing back a record disc mounted on said turn-table assembly, and loading means for conveying said record disc from said record disc insertion slot along a predetermined plane on a straight line passing adjacent a playing position on said turn-table assembly until the center of said record disc reaches a position adjacent the center of said playing position of the turn-table assembly, wherein said loading means includes:

a carrier plate for carrying said record disc, said carrier plate being movable along said straight line toward and away from said turn-table assembly; and

a disc guide assembly including a pair of disc guide members movable toward and away from each other within said casing structure in the neighborhood of said slot, a pair of disc detectors respectively mounted on said disc guide members and respectively positioned to associate with



edge portions of said record disc, said disc detectors being adapted to produce disc association signals indicative of the relationship between said detectors and the edge portions of the record disc, and drive means for driving said disc guide members toward or away from each other substantially symmetrically with respect to said straight line in response to said signals until a predetermined relationship between said signals is produced.

4,539,671

RECORDING AND/OR REPRODUCING APPARATUS FOR A DISK

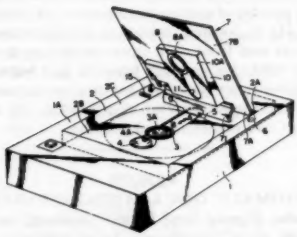
Teruaki Higashihara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 16, 1983, Ser. No. 532,842

Claims priority, application Japan, Sep. 24, 1982, 57-144435[U]; Sep. 24, 1982, 57-144436[U]

Int. Cl.³ G11B *3/36*

U.S. Cl. 369—213 **13 Claims**



1. A recording and/or reproducing apparatus for a disk comprising;

a main body having a recess formed therein for accommodating a disk,

a cover movably mounted on said main body and being movable between a first position to open said recess and a second position to close said recess,

a spindle unit for rotating a disk and being mounted on said main body for movement in a radial direction relative to said disk when said disk is being recorded and/or reproduced,

a disk presser operatively mounted to said cover to cooperate with said spindle unit for holding said disk,

holder means cooperating with said disk presser and being movably attached to said cover to limit movement of said disk presser to radial movement relative to said disk, and control means for moving said holder means to permit said disk presser to move with said spindle unit in said radial direction when said cover is in said second position.

4,539,672

LOW FRICTION PHONOGRAPH TONE ARM TRAVERSE

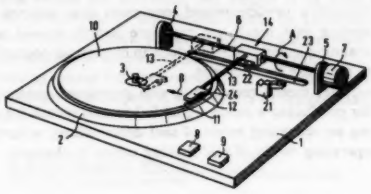
Hermanus F. Einhaus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,742

Claims priority, application Netherlands, Nov. 24, 1982, 8204561

Int. Cl.³ G11B *3/38*

U.S. Cl. 369—244 **16 Claims**



1. A record player comprising a turntable arranged for rotation about a vertical axis, a horizontal rotatable spindle which extends tangentially with respect to said vertical axis and has a circumferential surface, a motor for rotating the spindle during operation of the record player, and a carriage which is movable axially along the spindle and which carries a tone arm having a stylus end extending in a horizontal direction from the carriage transversely to said spindle,

wherein said carriage comprises two bearings for supporting the carriage on the spindle during normal operation, said bearings being spaced from each other in the axial direction of the spindle and each having a bearing surface which is arranged to engage the spindle at part of the upper half of the circumferential surface only, thereby allowing the carriage to twist about the spindle upon rapid acceleration of said stylus end, and

the carriage comprises a support made of a vibration-damping material to which the tone arm is secured.

4,539,673

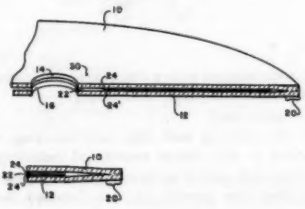
OPTICAL DISC AIR SEPARATION METHOD AND DEVICE

John S. Winslow, Altadena, Calif., assignor to Optical Disc Corporation, Cerritos, Calif.

Filed Jul. 26, 1983, Ser. No. 517,470

Int. Cl.³ H04N *5/76*; G01D *15/34*

U.S. Cl. 369—284 **18 Claims**



1. An optical information medium, comprising:

first and second resilient disc-shaped members,

said members being substantially rigidly bonded together adjacent their outer peripheries and substantially hermetically sealed adjacent their outer peripheries,

said member defining at least one air channel adjacent the center thereof,

said at least one air channel providing communication between the atmosphere and an unbonded region between said members, said air channel being sufficiently large to allow substantially instantaneous expansion of the spacing between said members over said unbonded area upon spinning of said medium about its central axis,

at least one of said members being at least partially transparent to light.

14. A method of forming an optical information storage member, comprising the steps of:

forming two disc-shaped members;

coating an inner surface of at least one of said members with an information layer; and

bonding the two members together such that:

the outer peripheries of the two members are mechanically constrained to remain parallel;

the two members are unbonded over an annular information region; and

an air channel is present adjacent the center of the members which allows communication between the atmosphere and the information region; and

rotating the bonded members about their central axes, such that the members are pulled slightly apart over the information region.

4,539,674
METHOD OF PROVIDING ADAPTIVE ECHO CANCELLATION IN TRANSMISSION OF DIGITAL INFORMATION IN DUPLEX, AND APPARATUS FOR PERFORMING THE METHOD

Bengt R. Carlqvist, Bromma, and Lars T. E. Svensson, Skärholmen, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

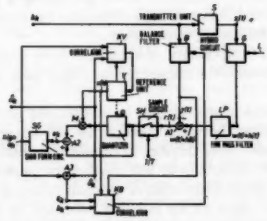
PCT No. PCT/SE82/00363, § 371 Date Jun. 16, 1983, § 102(e) Date Jun. 16, 1983, PCT Pub. No. WO83/01716, PCT Pub. Date May 11, 1983

PCT Filed Nov. 2, 1982, Ser. No. 514,825

Claims priority, application Sweden, Nov. 2, 1981, 8106444

Int. Cl.³ H04B *3/24*

U.S. Cl. 370—32 **2 Claims**



1. In a telecommunication system wherein digital information is transmitted in duplex via a hybrid circuit and a single conductor pair between first and second transmitter-receiver means, the method of minimizing at said first transmitter-receiver means disturbances in a line signal received via said single conductor pair and said hybrid circuit from said second transmitter receiver means when said first transmitter-receiver means is also transmitting signals representing data symbols b_k to said second transmitter receiver means, said method comprising the steps of providing in said first transmitter-receiver means a balancing filter means for creating a plurality of balancing signals, subtracting a selected balancing signal from the line signal received from said second transmitter-receiver means and the disturbances arising from the signal being transmitted by said first transmitter-receiver means to provide a difference signal, periodically sampling the difference signal to generate a sampled signal, quantizing said sampled signals to form an estimation of the digital data represented by said line signal, generating a controllably variable reference signal, multiplying said reference signal by said estimation signal to form a product signal, substracting said sampled signal from said product signal to form an error signal correlating said error signal and said sampled signal, varying said controllably variable reference signal in response to said correlating step to decrease said error signal, adding said error signal to said sampled signal to form an auxiliary signal, correlating said auxiliary signal with a data symbol then represented by a transmitted signal and changing the selected balancing signal created by said balancing filter so that there is less correlation between said auxiliary signal and said data symbols whereby the influence on the convergence of said balance filter by said line signal is eliminated.

4,539,675
ECHO CANCELLER

David A. Fisher, Saffron Walden, England, assignor to International Standard Electric Corporation, New York, N.Y.

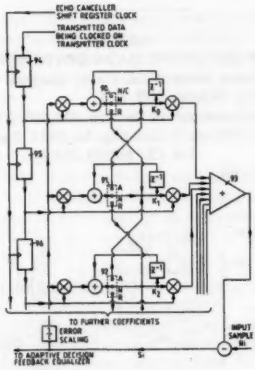
PCT No. PCT/GB82/00329, § 371 Date Jul. 15, 1983, § 102(e) Date Jul. 15, 1983, PCT Pub. No. WO83/01876, PCT Pub. Date May 26, 1983

PCT Filed Nov. 18, 1982, Ser. No. 522,378

Claims priority, application United Kingdom, Nov. 19, 1981, 8134898

Int. Cl.³ H04B *3/20*

U.S. Cl. 370—32 **13 Claims**



1. In a communications system in which digital information such as PCM data signals having a given symbol rate are conveyed over a two wire circuit, with said two wire circuit coupled to an input of a line hybrid, with said hybrid providing at one output a transmission channel port for transmitting data to said two wire line and at another output a receiving channel port for receiving data representing data symbols from said two wire line, said system undesirably including due to imperfection in said hybrid unwanted echo signals due to undesired coupling between said transmitting and receiving channels, the combination therewith of apparatus for cancelling said unwanted echo signals, comprising:

analog to digital converter means having an input coupled to said receiving channel port for providing at an output a digital signal for each received data symbol and having a control input to provide said digital signal indicative of said received data symbol at a specific timing interval,

a digital filter having a transform selected to provide a filtered response at an output according to $(1-Z^{-1})$ and

having an input coupled to the output of said analog to digital converter,

a subtractor circuit having a first input coupled to the output of said digital filter,

a sample and hold circuit means having an input coupled to said transmission port of said hybrid and having an output,

a digital adaptive echo simulator having an input coupled to the output of said sample and hold circuit with an output coupled to a second input of said subtractor circuit, said echo simulator incuding a transversel filter having variable coefficient capability and which filter includes plurality of coefficient generators for generating filter coefficients at given delays, with said delay of each generator controlled by an associated multiplexer for each coefficient generator,

an adaptive descision feedback equalizer means having an input coupled to the output of said subtractor circuit for providing at an output a timing signal indicative of the timing of the received data symbols as applied to said subtractor and as modified by said adaptive echo simulator said equalizer including means for continuously estimating the impulse response at said receiving channel port based on said timing signal,

a timing extraction controller having an input coupled to said feedback equalizer and responsive to said timing signal for providing at an output a control signal which output is coupled to said control input of said analog to digital converter, whereby said analog to digital converter is forced to provide said digital output signal according to said control signal from said equalizer to thereby cause said output of said subtractor to provide a version of said received signal from which said unwanted signals have been substantially removed.

4,539,676

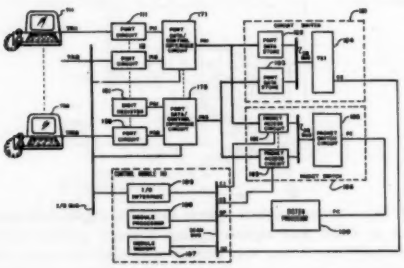
BULK/INTERACTIVE DATA SWITCHING SYSTEM

James A. Lucas, Broomfield, Colo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 374,400, May 3, 1982, abandoned. This application Sep. 13, 1982, Ser. No. 417,504

Int. Cl.[3] **H04Q** *11/04*

U.S. Cl. 370—60 **32 Claims**



1. In a switching system which serves a plurality of communications circuit (T11–T58) each capable of generating multiple and concurrent types of transmissions and where each of said communication circuits is connected to an associated port circuit (111–158) where each port circuit is capable of concurrently transmitting all of said multiple types of transmission, a switching network for establishing communications connections among said communications circuits (T11–T58) by interconnecting said associated port circuits (111–158) comprising:

two or more switch segment means (101, 106) each of which serves all of said associated port circuits (111–158) wherein each of said switch segment means is responsive to a different one of said multiple types of transmissions;

interface means (171–175) connected to and interconnecting all of said associated port circuits (111–158) to all of said switch means (101,106), and responsive to all types of multiple and concurrent transmissions orginating from each of said associated port circuits (111–158) for sorting said multiple and concurrent transmissions by type of transmission; and

means in said interface means (171—175) responsive to said transmissions sorted by type for routing each of said sorted transmission to the one of said switch segment means (101, 106) responsive to said type of transmission.

4,539,677

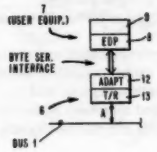
MULTIPLE ACCESS DATA COMMUNICATION SYSTEM

Yuan-Chang Lo, Boca Raton, Fla., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 28, 1983, Ser. No. 518,176

Int. Cl.[3] **H04J** *3/02, 3/00, 6/00*

U.S. Cl. 370—85 **11 Claims**



1. A method of transmitting multi-byte information messages between transceivers linked in a multiple access mode to a common bus, each transceiver interfacing between the bus and a respective user device, each device containing a general purpose computer adapted for multiple applications, comprising:

transmitting digital signals representing a said message from any one of said user devices through a respective one of said transceivers to said bus, said signals being arranged in a bit-serial asynchronous baseband form, said signals containing groups of first signals representing information bytes, each such byte group preceded by a respective group of second signals defining the beginning of the respective byte group, each said second group consisting of paired stop and start signal elements; the stop and start elements in each pair having different amplitude levels providing a transition on said bus which forms a time reference for reception of the bits in the following byte group;

receiving and temporarily storing said byte groups one at a time at transceivers connected to other said user devices; and

timing durations of stop signals in said second groups to allow sufficient time between receptions of consecutive byte groups at said other devices to permit respective computers of said other devices to be interrupted and perform real time processing operations relative to each received byte group while a next byte group is being received, as required for handling reception of the respective message.

4,539,678

SYNCHRONIZATION SYSTEM FOR A CLOSED-LOOP MULTIPLEX COMMUNICATION NETWORK

Modeste Ambroise, Vence; Michel Demange, Saint Jeannet, both of France; Gerald Lebizay, Larchmont, N.Y.; Jean-Marie Munier, Cagnes Sur Mer, and Michel H. P. Peyronenc, Saint Jeannet, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1983, Ser. No. 563,494

Claims priority, application European Pat. Off., Dec. 29, 1982, 82430043.8

Int. Cl.[3] **H04J** *3/00, 3/06*

U.S. Cl. 370—86 **4 Claims**

1. A synchronization system for a communication system

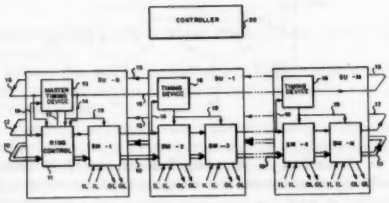
wherein a plurality of units (SM-1, SM-N) are connected in series by means of a unidirectional closed-loop link (10) operating in the time-division multiplex mode with recurrent frames of equal duration each of which is divided into a plurality of equal time intervals during which said closed-loop link (10) carries a plurality of time-division channels, said synchronization system including loop control means (11) inserted in said closed-loop link (10) and being characterized in that it comprises:

a random access memory (173),

input means (170) for applying the contents of the closed-loop link upstream of said loop control means (11) to the data input of said memory (173),

output means (176) for applying the output data from said memory to said closed-loop means downstream of said loop control means,

first counter means (IAC) for sequentially generating input addresses under control of an incoming timing signal (2MCR) and for supplying during each of said time intervals an input address specifying the location of said memory (173) where the output from said input means is to be stored,



second counter means (OAC) for sequentially generating output addresses under control of an outgoing timing signal (−2MCT) and for supplying during each of said time intervals an output address specifying the location of said memory (173) that is to be read out,

means (−4MCT, 182) for controlling read operations to be performed in said memory (173) during a fixed readout period (READ) within each of said time intervals,

means (183, 186) for selectively controlling write operations to be performed in said memory (173) during either of two fixed write periods (WA and WB) within each of said time intervals dependent upon the delay of the incoming timing signal relative to the outgoing timing signal,

a closed-loop timing link (15) closed by a master timing device (13) that sends said outgoing timing signal (2MCT) thereon and receives therefrom said incoming timing signal (2MCR), and

a plurality of slave timing devices (18) inserted in said closed-loop timing link to regenerate the timing signal traveling thereon, with each of said slave timing devices deriving from the regenerated timing signal a timing signal that exhibits a higher frequency (16 MHz) than said regenerated timing signal and is applied to a group (SU-1, SU-M) comprising at least one unit.

4,539,679

SYNCHRONIZATION IN A COMMUNICATION NETWORK OF INTERCONNECTED RINGS

Werner K. Bux, Richterswil, Switzerland; Roy C. Dixon, Cary, N.C., and Ernst H. Rothauser, Reichenburg, Switzerland, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 23, 1983, Ser. No. 554,646

Claims priority, application European Pat. Off., Nov. 26, 1982, 8211093.1

Int. Cl.³ H04J *3/02, 3/00*

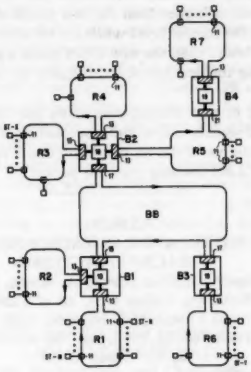
U.S. Cl. 370—88 **8 Claims**

1. A communication network for transporting synchronous data traffic and asynchronous data traffic interspersed therebetween comprising:

a plurality of token access rings in which synchronous traffic is inititated by an authorized synchronous station connected thereto upon receipt of a free synchronous token frame and in which asynchronous traffic is initiated by an asynchronous station upon receipt of a free asynchronous token frame;

a bridge for interconnecting said rings,

said bridge including at least one synchronous bandwidth manager means (SBM) for each ring connected thereto,



one only of said SBM means being configured as a master synchronous bandwidth manager (MSBM),

said one MSBM periodically generating and transmitting a unique control signal over a separate conductor to all SBM means;

each of said SBM means receiving a said unique control signal generating and transmitting over its connected ring a free synchronous token frame; and

each of said SBM means including said one MSBM means generating and transmitting a free asynchronous token frame upon the completion of a synchronous transmission cycle.

4,539,680

CHIP TO CHIP INFORMATION BIT TRANSMISSION PROCESS AND DEVICE

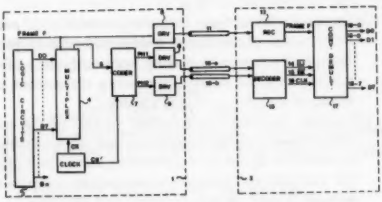
Gerard Boudon, Mennecy; Pierre Mollier, Boissise Le Roi, and Gerard Lebesherais, Perthes, all of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 1, 1983, Ser. No. 556,803

Claims priority, application European Pat. Off., Dec. 28, 1982, 82430045.3

Int. Cl.³ H04J *3/06;* **H04L** *3/00, 25/34, 25/49*

U.S. Cl. 370—100 **8 Claims**



1. A process for transmitting information bits generated by first circuits on a first chip to second circuits on a second chip, in which the bits to be transmitted belong to a serialized bit

stream, one bit per clock periods, characterized in that it includes the following steps:

generating in the first chip a saw-tooth signal (CK') having an amplitude higher than the amplitude of the bits to be transmitted and a period of two clock periods,

generating in the first chip a first and a second signal PH1 and PH2 from the bit stream ($\overline{D}$) and its complement (D), said first signal being at a first level when the bit stream level is higher than the saw-tooth clock signal level and being at a second level when the bit stream level is lower than the saw-tooth clock signal level, and the second signal being at the first level when the bit stream complement level is higher than the saw-tooth clock signal and being at the second level when the bit stream complement level is lower than the saw-tooth clock signal level,

transmitting the first and second signals to the second chip, and

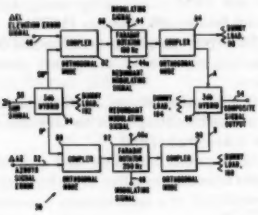
generating in said second chip from the first and second received signals, a first and a second signal ($\overline{DJ}$ and $\overline{DK}$) representative of the bit condition and a recovered clock signal (CLK) defining each bit period.

4,539,681

FERRITE MODULATOR ASSEMBLY FOR BEACON TRACKING SYSTEM

Thomas Hudspeth, Malibu; Harold A. Rosen, Santa Monica, and Fritz Steinberg, Culver City, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Feb. 25, 1983, Ser. No. 469,870
Int. Cl.³ H04J 15/00
U.S. Cl. 370—119 **15 Claims**



6. A modulator system for converting a three-channel input microwave signal to a single-channel output microwave signal comprising:

(a) means for converting said three-channel signal to a two-channel signal of which a first signal is carried by a first microwave section and of which a second signal is carried by a second microwave section;

(b) the signals in each of said sections having horizontal and vertical polarization components of which the vertical component produced by a third input signal of said three-channel input signal is common to both said first section and said second section;

(c) each of said sections including a rotator for rotating the polarization of the signal contained in the respective sections, said rotation occurring upon activation of said rotator, the original polarization being maintained in the absence of activation of said rotator;

(d) means for combining output signals of the rotators in each of said sections to produce said single-channel output microwave signal, said combining means including means for extracting a common polarization component of the signals of each of said sections; and wherein

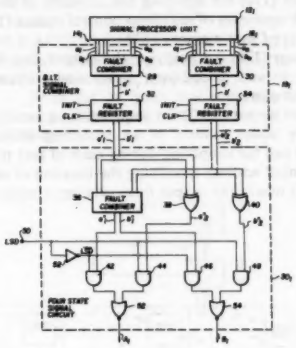
(e) each of said rotators, upon activation by a modulating signal introduces a modulation pattern to the rotation of the polarization resulting in the production of an amplitude modulation in said single-channel microwave signal.

4,539,682

METHOD AND APPARATUS FOR SIGNALING ON-LINE FAILURE DETECTION

Jan S. Herman, Holliston; Peter A. Morrison, and Gerald P. Richards, both of Framingham, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 11, 1983, Ser. No. 484,107
Int. Cl.³ G06F 11/00
U.S. Cl. 371—15 **19 Claims**



1. A method of signaling failures and their causality by built-in test apparatus for a digital type electrical system including at least one signal processing unit subject to different types of failures, comprising the steps of:

signaling operational status of said signal processing unit to first level status collector means by way of a plurality of two wire digital signaling paths, each of which respectively provides an initial two state status report of failure or no failure of a different one of said types of failure to said first level status collector means; and

converting said two wire digital signaling paths, upon the signaling of a failure, into two wire digital signaling paths providing to said first level status collector means respective secondary plural state status reports conveying information as to the type and therefore the cause of failure initially reported.

4,539,683

METHOD AND APPARATUS FOR CHECKING ANALOG-TO-DIGITAL CONVERTERS, DIGITAL-TO-ANALOG CONVERTERS, OR TELECOMMUNICATIONS TRANSMISSION LINKS WHICH CONTAIN SUCH CONVERTERS

Helmuth Hahn, Hohenschaftlarn; Werner Cordt, and Winfried Borm, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

PCT No. PCT/DE82/00143, § 371 Date Feb. 16, 1983, § 102(e) Date Feb. 16, 1983, PCT Pub. No. WO83/00231, PCT Pub. Date Jan. 20, 1983
PCT Filed Jul. 8, 1982, Ser. No. 474,636
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1981, 3126939; May 13, 1982, 3218066
Int. Cl.³ G06F 11/00
U.S. Cl. 371—15 **18 Claims**

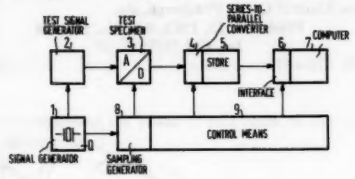
1. A method for checking test specimens comprising analog-to-digital converters or telecommunications transmission links which contain such converters or are connected in series thereto, comprising the steps of:

(a) generating an analog periodic test signal and selecting its period in comparison to a sampling period on which digitization is based such that all sampling times lying within

a predetermined test time span extending over a plurality of periods of the test signal occupy predetermined different relative time positions within a period interval of the test signal;

(b) supplying the analog test signal to an analog input of the test specimen, the test specimen having as a response at its output digital signal samples during the predetermined test time span which all correspond to different argument values of the test signal;

(c) depositing in a store at least a part of digital words forming said digital signal samples; and



(d) determing an actual transfer characteristic of the test specimen by

(i) sorting the stored digital words in accordance with their relative time position within the period interval of the test signal,

(ii) compiling amplitude values corresponding to the digital words to form a curve representing a signal response of the test specimen to the test signal, and

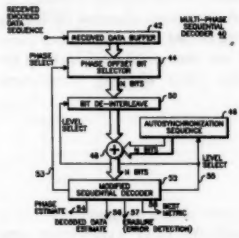
(iii) comparing the curve with a curve of the original test signal.

4,539,684

AUTOMATIC FRAME SYNCHRONIZATION RECOVERY UTILIZING A SEQUENTIAL DECODER

Kevin L. Kloker, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1983, Ser. No. 456,233
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—46 **12 Claims**



1. A digital communications system for automatically recovering frame synchronization and accomplishing error correction, said digital communication system comprising:

an encoder for encoding data on said digital communication system, said encoder comprising:

convolutional encoder means for convolutionally encoding data in a convolutionally encoded sequence for transmission on said digital communication system;

storage means for storage of a predetermined autosynchronization sequence therein;

combiner means for generating a modulo 2 sum sequence of the convolutionally encoded sequence and the autosynchronization sequence for transmission over the communication system such that the Nth bit of the sum sequence is the exclusive OR of the Nth bit of the autosynchronization sequence in said storage means, with the Nth bit of the convolutionally encoded sequence; and

a decoder for determining the frame synchronization, accomplishing error correction, and decoding said convolutionally encoded data transmitted on said digital communication system, the decoder comprising:

received data storage means for receiving and storing a predetermined number of received data bits from the encoder;

phase offset bit selector means for selecting N bits of the received data stored in said data storage means in response to a phase select signal from a sequential decoder means;

autosynchronization storage means for storing a predetermined autosynchronization sequence corresponding to the autosynchronization sequence stored at the encoder;

combining means for generating a bit stream such that the Nth bit of the bit stream is the exclusive OR of the Nth bit of the autosynchronization sequence in the decoder storage means, with the Nth bit from the phase offset bit selector means; and

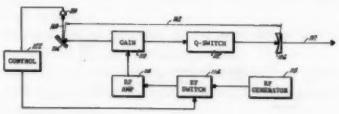
sequential decoding means for comparing convolutional codeword subsets with the bit stream from the combining means, selecting a codeword subset having the best metric and providing as outputs a decoded data estimate signal and a phase select signal corresponding to the selected codeword subset.

4,539,685

PASSIVELY Q-SWITCHED LASER HAVING A VARIABLE PULSE RATE

Richard A. Hart, Wethersfield, and Charles Bartkowski, Amston, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 2, 1982, Ser. No. 414,097
Int. Cl.³ H01S *3/09, 3/10*
U.S. Cl. 372—25 **3 Claims**



1. A passively Q-switched laser system having an optical cavity for resonating laser radiation, including an optical gain medium comprising:

RF means for applying RF power to said gain medium;

Q-switch absorbing means disposed within said optical cavity; and

means for coupling radiation out of said cavity, characterized in that:

said laser system includes a detector responsive to laser radiation resonated within said cavity for generating a signal;

controller means responsive to said signal for controllig said RF means for applying RF power to turn off said RF means for a predetermined off period commencing after a predetermined delay from said signal.

4,539,686

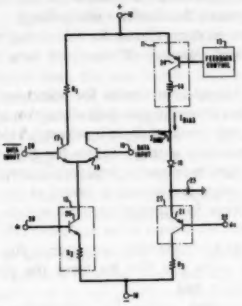
LASER DRIVING MEANS

Fridolin L. Bosch, Bethlehem, and Clarence B. Swan, Allentown, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 15, 1982, Ser. No. 434,583
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—26 **12 Claims**

1. A laser transmitter comprising a laser and circuit means for driving said laser in response to a data input signal, said circuit means comprising:

circuit means including a constant current source for supplying a dc bias current to said laser sufficient to raise the current through said laser above its lasing threshold level; and



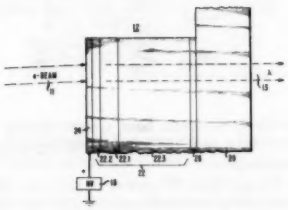
circuit means including a constant current source for supplying to said laser a modulation current corresponding to said data input so that said modulation current is subtracted from said dc bias current and the appearance of a pulse in said modulation current lowers the current through said laser to below its lasing threshold level.

4,539,687

SEMICONDUCTOR LASER CRT

Eugene I. Gordon, Convent Station, and Uri Levy, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 27, 1982, Ser. No. 453,577
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—43 **16 Claims**



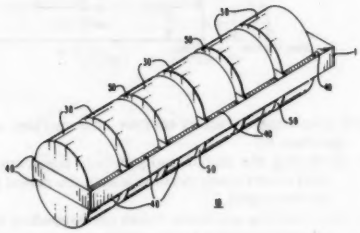
1. A scannable semiconductor laser comprising
a semiconductor target,
a source of an electron beam, and
means for scanning said electron beam across said target to generate a scanning laser light beam therefrom in essentially the same direction as that of said electron beam, characterized in that said target comprises
a pair of mirrors, at least one of which is metallic, forming a cavity resonator at the optical wavelength of said light beam, said scanning means making said electron beam incident on said metallic mirror, and
a plurality of epitaxial, essentially lattice-matched layers of the same conductivity type between said mirrors, said plurality including: a relatively thin, wide bandgap, buffer layer adjacent said one mirror; a thicker, wide bandgap, cavity-length-adjusting layer adjacent said other mirror; and a narrower bandgap active layer between said buffer layer and said cavity-length-adjusting layer,
the energy of said electron beam and the thicknesses of said buffer layer and said active layer being mutually adapted so that the peak of the electron energy absorption lies within said active layer.

4,539,688

SPAR TYPE CONSUMABLE ELECTRODES FOR VACUUM ARC MELTING OF ZIRCONIUM OR TITANIUM ALLOYS

Sylvester A. Weber, Pleasant View, Utah, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 13, 1983, Ser. No. 541,404
Int. Cl.³ H05B *7/07*
U.S. Cl. 373—67 **9 Claims**



1. A consumable electrode for use in arc melting of an alloy having Zr or Ti as its principal constituent and which is to contain a low melting point alloying constituent which melts at least 1000° F. below said principal constituent, said electrode comprising:
(a) a low resistance spar core extending substantially the length of said electrode, said spar core being substantially free of unalloyed low melting point alloy constituent; and
(b) an external member principally comprising an unalloyed low melting point constituent and compacted granules principally comprising Zr or Ti, said member being attached to said spar core in a manner to provide a relatively high resistance of said external member, in an axial direction of the electrode, whereby during operation, resistance heating of said external member away from an arc is minimized and thus premature melting of the unalloyed low melting point alloying constituent is generally avoided.

4,539,689

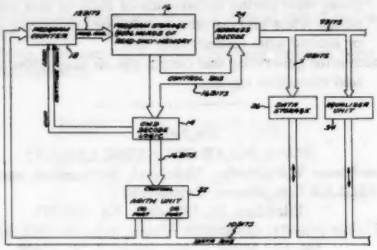
FAST LEARN DIGITAL ADAPTIVE EQUALIZER

Ran F. Chiu, Miami; Philip F. Kromer, III, Coral Gables; Ming L. Kao, Miami, and Henry H. Parrish, Miami Springs, all of Fla., assignors to Racal Data Communications, Inc., Miami, Fla.

Continuation of Ser. No. 335,638, Dec. 30, 1981, abandoned, which is a continuation of Ser. No. 164,361, Jun. 30, 1980, abandoned, which is a continuation of Ser. No. 900,265, Apr. 26, 1978, abandoned. This application Sep. 14, 1983, Ser. No. 532,155
Int. Cl.³ H04B *3/04*
U.S. Cl. 375—13 **101 Claims**

20. In an equalizer employing a clock means for successively sampling signals received by said equalizer, apparatus for correcting the phase error of said clock comprising:
means for producing a succession of arc tangents from successive samples taken;

means for utilizing a plurality of said arc tangents to compute; and



means for adjusting the phase of said clock to correct for said phase error.

4,539,690

AUTOMATIC AND ADAPTIVE DIGITAL NONLINEAR DECISION FEEDBACK EQUALIZER

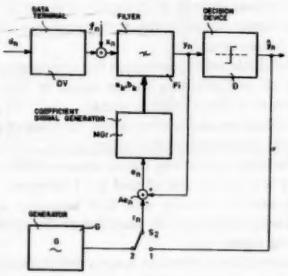
Joachim Speidel, Nuremberg, Fed. Rep. of Germany, assignor to Tekade Felten & Guillaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,395

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1981, 3116266

Int. Cl.³ H04B *3/14*

U.S. Cl. 375—14 **27 Claims**



1. An automatic and adaptive digital nonlinear decision feedback equalizer comprising

an input provision for entering signals;

a digital filter having a recursive part and a non-recursive part and connected to the input provision and generating an auxiliary signal (w_n);

a threshold decision device connected to the output of the digital filter for determining if the value at the input of the threshold decision device is coordinated to a certain signal level region;

a switch having a first input connected to the output of the threshold decision device and having its output connected to a recursive input of the digital filter; and

a reference signal source connected to a second alternate input of the switch for inducing in its switched on position in the digital filter a reference signal (r_n) for, in conjunction with the auxiliary signal, the determination of a step factor for the recursion process.

4,539,691

METHOD AND APPARATUS FOR ENCODING A BINARY DIGITAL INFORMATION SIGNAL

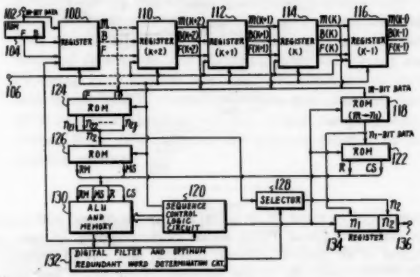
Hiroshi Ogawa, and Tamotsu Yamagami, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 10, 1982, Ser. No. 416,685

Claims priority, application Japan, Sep. 11, 1981, 56-143618

Int. Cl.³ H04L *3/00*

U.S. Cl. 375—37 **20 Claims**



1. A method of encoding a binary digital information signal comprised of m-bit information words occurring within a frequency band to produce an encoded binary digital information signal comprised of n-bit channel words, each n-bit channel word oeing comprised of an n_1-bit information word where $n_1 > m$ and an n_2-bit separation word, and said encoded binary digital information signal having a format with substantially reduced components thereof in a predetermined frequency range of said frequency band, said method comprising the steps of:

converting each m-bit information word into an n_1-bit information word;

generating a set of possible n_2-bit separation words for use with each n_1-bit information word;

determining an integrating transfer function characteristic including information with respect to said predetermined frequency range;

evaluating a step response, obtained by modifying each said n_1-bit information word and each respective possible n_2-bit separation word by said integrating transfer function characteristic, at at least one predetermined evaluation time to obtain a parameter having an overall value including information with respect to said predetermined frequency range;

selecting the one of said possible n_2-bit separation words for each of said n_1-bit information words in response to the value of said parameter; and

adding said selected ones of said possible n_2-bit separation words following each respective one of said n_1-bit information words to form said encoded binary digital information signal having said format with substantially reduced components thereof in said predetermined frequency range.

4,539,692

DIGITAL AUTOMATIC GAIN CONTROL CIRCUIT FOR PCM SIGNALS

Ernst A. Munter, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 359,896, Mar. 19, 1982, Pat. No. 4,439,639. This application Aug. 30, 1983, Ser. No. 527,860

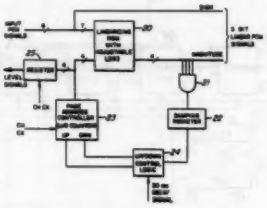
Claims priority, application Canada, Feb. 12, 1982, 396210

Int. Cl.³ G06F *15/36*; H03H *17/00*

U.S. Cl. 375—98 **3 Claims**

1. A digital automatic gain control circuit for the normalization and linearization of an input PCM signal and for measur-

ing the level thereof comprising a read-only-memory (ROM) partitioned into a plurality of pages of 2^n levels where n is the number of magnitude bits in the input PCM signal and each page represents an incremental loss table for translating the magnitude portion of the input PCM signal into a linear PCM signal, a page address controller for providing page addresses to the ROM, the ROM being responsive to said magnitude



portion of an input PCM signal and to one of said addresses for providing a linear PCM signal corresponding to said input signal at an output terminal thereof, and circuit means connected between the output terminal of the ROM and the controller for causing it to select a page that provides translated linear PCM signals having a predetermined level, the address of the selected page representing the level of the input PCM signal.

4,539,693

BIT SYNCHRONIZATION ARRANGEMENT FOR A DATA MODEM OR DATA RECEIVER

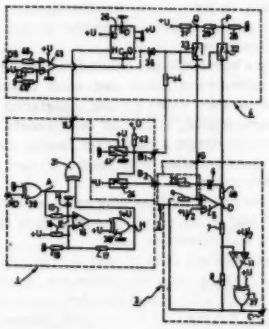
Robert Boudault, Limours, France, assignor to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Apr. 25, 1983, Ser. No. 488,574

Claims priority, application France, Apr. 28, 1982, 82 07325

Int. Cl.³ H04L *7/02*

U.S. Cl. 375—110 **12 Claims**



1. A bit synchronization apparatus for furnishing an output signal synchronized to asynchronously received data signals constituted by binary pulse trains having a base frequency and detectable transitions between binary states, comprising,

transition detector means for receiving said data signals and generating a correction pulse having a predetermined duration in response to each transition of said data signals;

oscillator means for generating a sequence of triangular signals each having a first and second side respectively having a finite first and second slope, said sequence of triangular signals having a frequency corresponding to said base frequency whereby an instantaneous phase shift exists between said received data signals and said triangular signals;

phase correction means interconnected between said transition detector means and said oscillator means for changing said first or said second slope in a direction decreasing said phase shift during occurrence of each of said correction pulses when said correction pulse occurs during said first or second side, respectively; and

means for generating said output signals in synchronism with said triangular signals.

4,539,694

NON-LINEAR COUNTING CIRCUIT

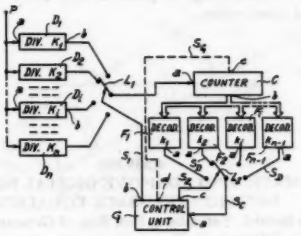
Jean-Pierre Wattenhofer, Neuchatel, Switzerland, assignor to ASULAB S.A., Bienne, Switzerland

Filed Sep. 23, 1983, Ser. No. 535,187

Claims priority, application France, Sep. 24, 1982, 82 16259

Int. Cl.³ H03K *1/300, 5/156, 3/78, 21/08*

U.S. Cl. 377—42 **3 Claims**



1. A non-linear counting circuit for a plurality of pulses, comprising:

n dividers adapted each to receive said pulses on their input, to divide them by integers $K_1, K_2, \ldots, K_n$ and to issue on their output a counting signal whenever $K_1, K_2, \ldots, K_n$ pulses have been counted;

a counter whose state at each instant is equal to the value of the non-linear counting function associated with the number of pulses counted;

first controllable selection means for connecting the output of one of said dividers to the input of said counter in response to a first selection signal;

n−1 decoding means for comparing the state of said counter with n−1 predetermined integers $k_1 k_2, \ldots, k_{n-1}$ and for each emitting a decoding signal whenever the state of said counter is equal to one of said n−1 integers;

a control unit for issuing said first selection signal and a second selection signal in response to the application of a decoding signal; and

second controllable selection means for connecting the output of one of said decoding means to the input of said control unit in response to said second selection signal.

4,539,695

X-RAY LITHOGRAPHY SYSTEM

Carlo La Fiandra, New Canaan, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 6, 1984, Ser. No. 568,775

Int. Cl.³ H01J *37/06;* **B65G** *1/06;* **A61K** *27/02*

U.S. Cl. 378—34 **2 Claims**

1. A method of treating a mask and wafer in an X-ray lithographic system comprising the steps of:

mounting a wafer on a cartridge at a load station;

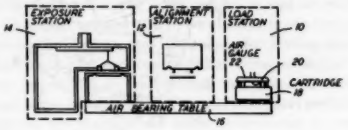
moving said cartridge upwardly to a kinematic mount in said load station;

adjusting in co-operation with an air gauge in said load station the tilt in two directions of said wafer and its proximity with respect to a mask position in said cartridge;

lowering said cartridge to its travel position;

moving said cartridge on its air feet to an alignment station;

mounting a mask on said cartridge; moving said cartridge upwardly to a kinematic mount in said alignment station;
adjusting the lateral alignment in the X and Y direction and the rotational alignment about a vertical axis of said wafer with respect to said mask;
lowering said cartridge to its traveling position with the mask retained;



moving said cartridge on its air feet to an X-ray exposure station;
moving said cartridge upwardly to a kinematic mount in said exposure station;
purging the area with helium gas; and
exposing said wafer with X-rays.

4,539,696

TARGET DEVICE FOR AN X-RAY EXAMINATION INSTALLATION

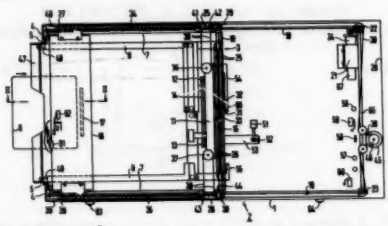
Christian Walling, Erlangen, and Helmut Schott, Fuerth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,385

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1982, 3207328

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—181 **14 Claims**



1. A target device for an X-ray examination installation comprising:
a cassette carriage;
means for moving said cassette carriage relative to an X-radiation cone from a right ready position through at least one exposure position to a left loading position and back for left and right side loading of an X-ray film cassette therein;
two opposed clamping jaws disposed parallel to one another carried on said cassette carriage, said clamping jaws being two-dimensionally displaceable relative to one another for adjustment in a common plane for receiving and retaining said X-ray film cassette therebetween;
at least one detent carried on said cassette carriage for fixing the position of said X-ray film cassette in the longitudinal direction of said clamping jaws;
a clamping slide carried on said cassette carriage and having a projection extending into said common plane of said clamping jaws, and means for moving said clamping slide relative to said carriage in said longitudinal direction of said clamping jaws;
a pair of tension members respectively interconnected between said clamping slide and said clamping jaws, said tension members being respectively conducted over deflection rollers, said deflection rollers being respectively urged by bias springs in a direction opposing movement of said clamping slide toward the right of said carriage;
a motor drivingly connected to said clamping slide for transporting said clamping slide from an extreme left position to an extreme right position relative to said cassette carriage, said clamping slide being transported by said motor against the force of said bias springs normally biasing said clamping slide towards said extreme left position; and
at least one spring interconnected between said clamping jaws for biasing said clamping jaws toward each other at said right loading position and for spreading said clamping jaws apart in said left loading position, said clamping slide disposed relative to said clamping jaws for forcing said clamping jaws toward one another against the force of said spring which normally spreads said clamping jaws apart at said left loading position, as said clamping slide is moved from said extreme left position relative to said cassette carriage.

4,539,697

FM STEREO DEMODULATING CIRCUIT

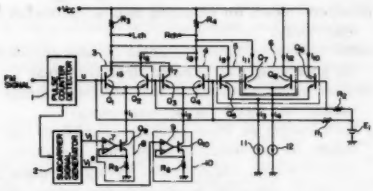
Kohji Ishida; Tatsuo Numata, and Masaharu Sakamoto, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Claims priority, application Japan, Sep. 4, 1982, 57-154223

Filed Sep. 6, 1983, Ser. No. 529,773

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—7 **4 Claims**



1. An FM stereo demodulating circuit comprising:
a first differential transistor pair (3) further comprising a first and second transistor with their emitters connected to each other;
a second differential transistor pair (4) further comprising a third and a fourth transistor with their emitters connected to each other;
a third differential transistor pair (5) further comprising a fifth and a sixth transistor with their emitters connected to each other;
a first current control means (2, 8) for controlling a first current supplied to said first differential pair for varying said first current in accordance with a positive phase signal of a sinusoidal subcarrier signal synchronized with a stereo pilot signal in a stereo composite signal which is an FM detection signal;
a second current control means (2, 9) for controlling a second current supplied to said second differential transistor pair for varying said second current in accordance with a negative phase signal of said sinusoidal subcarrier;
means (1, E_1, R_1 and R_2) for generating positive and inverted phase pulse train signals having frequency spectrum components of said stereo composite signals, the respective bases of said first, fourth and fifth transistors being supplied with said positive phase pulse train signal and the respective bases of said second, third and sixth transistors being supplied with either said inverted phase pulse train signal or a predetermined bias, whereby a left and a right channel signal are obtained from the respective collector currents of at least said first to fifth transistors.

4,539,698

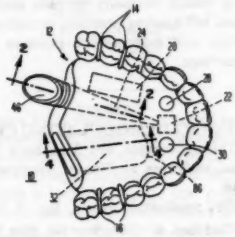
REPLACEABLE SALIVA BARRIER FOR INTRA-ORAL LARYNX

Philip Katz, Princeton Junction; Henry S. Brenman, Cinnaminson, both of N.J.; Louis D. Lowry, Villanova, and Harold Schwartz, King of Prussia, both of Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 438,376, Nov. 1, 1982, , and Ser. No. 428,848, Sep. 30, 1982, Pat. No. 4,502,150, which is a continuation of Ser. No. 249,140, Mar. 30, 1981, Pat. No. 4,473,905, said Ser. No. 438,376, is a continuation-in-part of Ser. No. 249,140, Mar. 30, 1981. This application Nov. 1, 1983, Ser. No. 547,740

Int. Cl.[3] A61F *1/20*

U.S. Cl. 381—70 3 Claims



1. An intra-oral artificial larynx comprising:

prosthetic means for mounting said larynx within the intra-oral cavity;

signal generation means mounted on said prosthetic means for generating a preselected electrical signal;

speaker means mounted on said prosthetic means for converting said signal into acoustic energy;

a horn having an input opening coupled to said speaker means for acoustically amplifying the output of said speaker means, said horn also having an output opening;

a mounting removably mounted to said output opening and having a microporous membrane fixed thereto for precluding the penetration of saliva into said horn;

a tongue activatable switch for enabling said signal generation means and said speaker means; and

a power source for said signal generation means and said speaker means.

4,539,699

REPLACEABLE BATTERY PACK FOR INTRA-ORAL LARYNX

Philip Katz, Princeton Junction; Henry S. Brenman, Cinnaminson, both of N.J.; Louis D. Lowry, Villanova, and Harold Schwartz, King of Prussia, both of Pa., assignors to Thomas Jefferson University, Phildelphia, Pa.

Continuation-in-part of Ser. No. 438,376, Nov. 1, 1982, which is a continuation-in-part of Ser. No. 249,140, Mar. 30, 1981, Pat. No. 4,473,905, and a continuation-in-part of Ser. No. 428,848, Sep. 30, 1982, Pat. No. 4,502,150, which is a continuation of Ser. No. 249,140. This application Nov. 1, 1983, Ser. No. 547,777

Int. Cl.[3] A61F *1/20*

U.S. Cl. 381—70 8 Claims

1. An intra-oral artificial larynx, comprising:

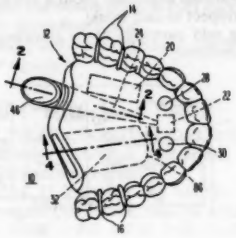
prosthetic means for mounting said larynx within the intra-oral cavity;

signal generation means mounted on said prosthetic means for generating a preselected electrical signal;

speaker means mounted on said prosthetic means for converting said signal into acoustic energy;

a tongue activatable switch for enabling said signal generation means and said speaker means; and

a power source mounted on a carrier, said carrier being removably mounted on said prosthetic means for powering said signal generation means and said speaker means;



said power source, said signal generation means and said speaker means being mounted on said prosthetic means entirely within the palatal area defined by the interior margin of the teeth.

4,539,700

PERSONAL PORTABLE AUDIO DEVICE

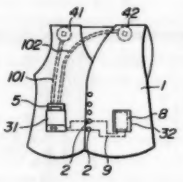
Masanobu Sato, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 511,718, Jul. 7, 1983, abandoned, which is a continuation of Ser. No. 210,292, Nov. 25, 1980, abandoned. This application Apr. 4, 1984, Ser. No. 596,570

Claims priority, application Japan, Nov. 26, 1979, 54-16351; Nov. 26, 1979, 54-163532

Int. Cl.[3] H04B *1/00;* H04M *1/04*

U.S. Cl. 381—90 3 Claims



1. A personal portable audio device comprising a vest-like sleeveless outer garment arranged to be worn by a wearer, said vest-like sleeveless outer garment comprising a back part and a front part connected to said back part, said front part comprising a first front part section and a second front part section, each said first and second front part section having a free edge extending upwardly when said garment is worn by the wearer, means on said first and second front part sections for selectively joining said first and second front parts sections together along said free edges so that said front part can be worn in the open condition or in the closed condition, each of said first and second front part sections having a pocket therein and a shoulder portion spaced upwardly from said pocket when said garment is worn by the wearer, said garment being formed by a surface cloth facing outwardly and a lining located opposite said surface cloth and facing inwardly when said garment is worn, said surface cloth and lining defining a space therebetween, a speaker mounted on each said shoulder portion of said front part of said garment with said speakers being located between said surface cloth and lining whereby said speakers are not visible on the exterior of said garment, said pockets being open on the exterior of said garment, audio components positioned in at least one of said pockets, a power source located within said garment, said power source located in one of said first and second front part sections and said audio components located in the other one of said first and second front part

sections, first lead wires located between said surface cloth and lining within the garment and connecting said audio components with said speakers, second lead wires located between said surface cloth and lining for selectively connecting said audio components and power source whereby said first and second lead wires are not exposed on the exterior of said garment, said second lead wires being located in said first and second front part sections so that when said first and second front part sections are in the open condition said second lead wires are disconnected and said power source is not connected to said audio components, and said means for joining said first and second front part sections together being arranged with said means connected to said second lead wires so that said second lead wires in said first and second front part sections are interconnected for placing said audio components in connection with said power source when said first and second front parts are in the closed condition, said means comprising hooks secured on said first and second front part sections along said free edges thereof for securing said first and second front part sections in the closed condition, and said hooks being connected to said second lead wires for interconnecting said second lead wires in said first and second front part sections.

4,539,701

PHOTOGRAMMETRIC STEREOPLOTTER

Ronald E. Galbreath, Elizabeth, and Bruce R. Harrison, Wanniassa, both of Australia, assignors to The Commonwealth of Australia, Australia

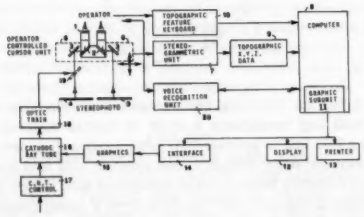
PCT No. PCT/AU82/00161, § 371 Date Dec. 10, 1982, § 102(e) Date Dec. 10, 1982, PCT Pub. No. WO83/01305, PCT Pub. Date Apr. 14, 1983

PCT Filed Sep. 24, 1982, Ser. No. 448,848

Claims priority, application Australia, Oct. 1, 1981, PF1004

Int. Cl.³ G01C *11/12;* G06K *9/00*

U.S. Cl. 382—1 **6 Claims**



1. A method of plotting an image through a stereoscopic binocular unit from a pair of spatially separated masters comprising the steps of:

operating a cursor on X Y model coordinates and observing a measuring mark having its apparent height at an altitude above a datum line selected by the spatial separation of measuring marks, one above an image of each of said masters, to produce a Z model coordinate;

transferring said X Y Z model coordinates to a computer to produce an image trace;

processing said model coordinates to produce image coordinates to reduce subsequent visual disturbances;

applying said image trace to: (a) a display means, (b) a picture tube and (c), by means of an optic train, said stereoscopic binocular unit to be superimposed on a stereoscopic image of sad masters; and

applying further control and data feed-back by a voice recognition unit coupled to said computer.

4,539,702

BILL DISCRIMINATING METHOD

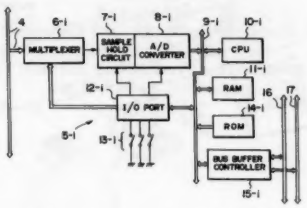
Yoshinobu Oka, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1984, Ser. No. 568,715

Claims priority, application Japan, Jan. 8, 1983, 58-1458

Int. Cl.³ G06K *9/64*

U.S. Cl. 382—7 **1 Claim**



1. In a bill discriminating method in which a bill pattern is extracted in accordance with signals derived from selected optimum channels out of a plurality of channels connected to sensors disposed in the path across which a bill moves, and the bill is discriminated through comparing said bill pattern with a reference pattern set up previously in accordance with discriminating operation modes and the kinds of bills, an improvement which comprises utilizing: a mode change-over switch for selecting and appointing one of said discriminating operation modes, bill discriminating units each having an internal memory and a channel selecting means, and a common memory accessible commonly from said bill discriminating units and adapted to store reference patterns and the channel numbers of the channels to be selected; and taking the following steps:

(a) a first step in which each of said bill discriminating units reads, out of said common memory, the selected and appointed discriminating operation mode, the kind of bill and it corresponding reference pattern, and the channel numbers of the channels to be selected, and writes the same in its internal memory;

(b) a second step in which each bill discriminating unit selects the channels in accordance with the channel numbers written in the internal memory thereof and extracts the bill pattern in accordance with the signals derived through respective channels;

(c) a third step in which each bill discriminating unit compares said bill pattern extracted in the second step (b) with the reference pattern written in said internal memory thereof; and

(d) a fourth step in which the bill is discriminated in accordance with the result of the comparison made in each bill discriminating unit.

4,539,703

VIDEO DATA ACQUISITION SYSTEM AND HAND-HELD APPLICATION MODULE FOR OPERATION THEREOF

Melvin R. Clearman, and Clyde H. Springen, both of Austin, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 5, 1982, Ser. No. 355,285

Int. Cl.³ G06K *9/52;* H04N *5/30;* G06F *15/46*

U.S. Cl. 382—28 **6 Claims**

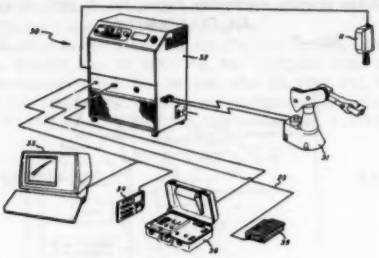
1. A method of visually identifying an article and its orientation, employing a video data acquisition system having a video camera for taking a picture of the article and having means for requiring, digitizing and identifying signals from the camera as pixels forming the image of a picture comprising the steps of:

(a) taking a picture of the article;

(b) counting the total number of pixels in the rows, columns

and diagonal lines, respectively, of the image of the picture;

(c) computing the area of the article determined by the total number of pixels, and the perimeter of the article; and



(d) computing the maximum and minimum moments determined by the row, column and diagonal line total pixel counts.

4,539,704

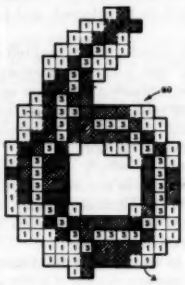
IMAGE THINNING PROCESS

Jose Pastor, Westport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 532,255, Sep. 15, 1983, abandoned. This application Feb. 21, 1984, Ser. No. 581,519

Int. Cl.³ G06K *9/44*

U.S. Cl. 382—55 **25 Claims**



1. A machine process for thinning an image, comprising the steps of:

defining an image in terms of a plurality of discrete picture elements (pixels);

convolving each horizontal string of pixels of the image with itself shifted a predetermined number of pixels;

weighting each shifted position of each horizontal string;

selecting certain of the pixels of the weighted horizontally convolved pixel strings which correspond to predetermined descriptors;

convolving each vertical string of pixels of the image with itself shifted a predetermined number of pixels;

weighting each shifted position of each vertical string;

selecting certain of the pixels of the weighted vertically convolved pixel strings which correspond to predetermined descriptors;

adding the selected pixels from the horizontal and vertical weighted convolutions and the pixels of the original image;

retaining those pixels which are common to the original image and the selected pixels of both the horizontal and vertical weighted convolutions;

discarding those pixels which are absent from the original image;

filtering those pixels which are common to the original image and to the original image and only one of the selected pixels of the horizontal and vertical weighted convolutions;

further retaining certain of the filtered pixels and discarding others in accordance with a predetermined filter matrix; and

providing an output signal of the retained pixels which represents a thinned image.

4,539,705

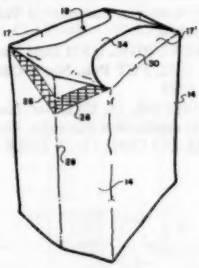
BAG WITH CARRYING HANDLE

Patrick A. Baines, Charlotte, N.C., assignor to Venture Packaging, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 487,197, Apr. 21, 1983, abandoned. This application May 21, 1984, Ser. No. 612,248

Int. Cl.³ B65D *30/00*

U.S. Cl. 383—8 **16 Claims**



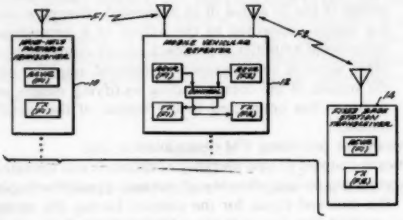
1. A bag for receiving and containing merchandise and the like, said bag comprising a sheet of flaccid material folded along a fold line to provide two juxtaposed wall panels having adjacent side edges joined to one another, said fold line being tucked inwardly between said juxtaposed wall panels forming top edges along said wall panels to form a gusset consisting of the overlapping portions of said wall panels, a separate strip of material folded along a fold line extending along the length thereof to provide side portions on opposite sides of said fold line, said strip being disposed within said gusset to extend across the width thereof with said fold line of said strip lying most closely adjacent to said inwardly tucked fold line of said sheet of flaccid material and with said side portions of said strip extending away from said inwardly tucked fold line to be respectively adjacent said overlapping portions of said wall panels, and seal means joining the side portions of said strip of material at each end thereof to the respective adjacent overlapping portions of said wall panels at seals formed in a V-shaped pattern defined by lines extending diagonally between said side edges and said top edges of said wall panels whereby the filling of said bag with merchandise will result in said wall panels assuming an open disposition having an end panel formed by said gusset and with said strip extending across said end panel and adjacent thereto in an unfolded flattened condition to provide a handle for lifting said carrying said bag with the weight of said merchandise being borne at said seals.

4,539,706

MOBILE VEHICULAR REPEATER SYSTEM WHICH PROVIDES UP-LINK ACKNOWLEDGEMENT SIGNAL TO PORTABLE TRANSCEIVER AT END OF TRANSCEIVER TRANSMISSION

David F. Mears, and Hubert A. Patterson, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Feb. 3, 1983, Ser. No. 463,587
Int. Cl.³ H04B *7/15*
U.S. Cl. 455—11 **14 Claims**



9. A method of operating a radio repeater system of (a) at least one portable transceiver transceiving on frequency channel F1, (b) at least one mobile repeater which transceives on frequency channels F1 and F2 so as to provide automatic radio repeater services between the portable transceiver, and (c) another base transceiver operating on frequency channel F2, said method comprising the steps of:

receiving a mobile repeater information transmitting on frequency channel F1 from a portable tranceiver;

automatically and substantially simultaneously retransmitting verbatim from said mobile repeater said information on frequency channel F2; and

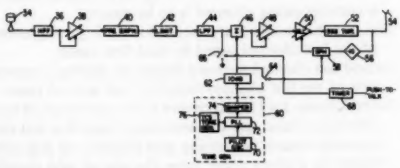
detecting the termination of said received portable transceiver transmission on frequency F1 which is to be automatically repeated verbatim on frequency F2 and, in response to such detected termination, automatically sending an up-link acknowledgement signal to the portable transceiver on channel F1 signifying the successfully concluded receipt of the portable F1 transmission to be automatically repeated so as to give the operator of the portable transceiver a positive indication that the just concluded transmission was successfully received.

4,539,707

COMPRESSED SINGLE SIDE BAND COMMUNICATIONS SYSTEM AND METHOD

Paul H. Jacobs, Fairport, and Douglas P. Collette, Stafford, both of N.Y., assignors to Aerotron, Inc., Raleigh, N.C.

Filed Jun. 1, 1982, Ser. No. 384,148
Int. Cl.³ H04B *1/00, 1/16, 1/76*
U.S. Cl. 455—47 **30 Claims**



21. In a method of controlling the output power of a radio frequency transmitter in transmitting a composite audio modulation signal including audio signal components and a pilot tone component outside the audio signal passband but within the bandpass of the transmitter, the improvement including the steps of

(a) transmitting only the pilot tone component for a predetermined initial time interval, and

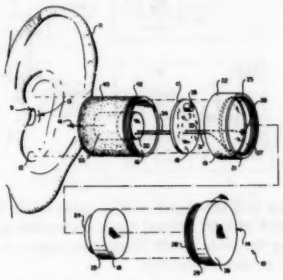
(b) adjusting the power level of the transmitter during the initial time interval and thereafter refraining from adjustment of the power level for the remainder of the transmission irrespective of the amplitude of the composite audio modulation signal.

4,539,708

EAR RADIO

Elwood G. Norris, Salt Lake City, Utah, assignor to American Technology Corporation, Salt Lake City, Utah

Filed Jul. 1, 1983, Ser. No. 511,360
Int. Cl.³ H04B *7/00, 1/08*
U.S. Cl. 455—49 **15 Claims**



1. A self-contained, fully operational radio receiving device adapted in size and configuration for implacement and retention at the entrance to an ear canal, said device being self-supported by surrounding ear cartilage which defines a casement support chamber, said device further comprising:

a casement having an outward and an inward housing as viewed in relation to casement position at the ear canal;

radio circuitry contained within the outward housing and positioned on an integrated circuit chip, said circuitry including (i) signal receiving means comprising a cylindrical antenna core positioned for axial orientation toward the ear canal for receiving radio transmissions, (ii) demodulating circuitry including an rf resonant circuit for selecting a desired transmission frequency and (iii) amplifying and filtering circuitry for producing a clear radio signal;

a power source coupled to the circuitry for powering circuit operation; and

speaker means contained within the inward housing of the casement and coupled directly to the amplification circuitry for receiving and converting said audio signals to audible sound, said speaker means being structured for directional orientation toward the ear canal;

said casement having maximum outside width dimensions smaller than the greatest distance across the casement support chamber at the ear canal entrance and no greater than approximately ¾ inch, said casement having a length from distal sides of the inward to outward housing of less than approximately one inch.

4,539,709

MEASUREMENT OF OSCILLATOR SPILLOVER NOISE IN A SINGLE SIDEBAND SYSTEM

William A. Conner, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 5, 1984, Ser. No. 586,534
Int. Cl.³ H04B *17/00*
U.S. Cl. 455—67 **3 Claims**

1. A method of measuring the performance of a single sideband transmitter and receiver which generate oscillator spill-

over noise lying in a spillover bandwidth at baseband frequencies, comprising the steps of:

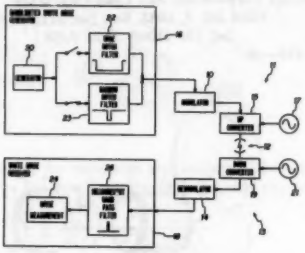
(a) generating a test signal which simulates a baseband input signal,

(b) filtering the test signal with a narrow notch filter having a bandwidth on the order of said spillover bandwidth,

applying the filtered test signal as a modulating input to said transmitter,

applying the transmitter output to said receiver, and

measuring noise in the receiver demodulated output in the band of the notch filter;



(c) filtering said test signal with a wide notch filter having a bandwidth at least several times said spillover bandwidth,

applying the wide notch filtered test signal as a modulating input to said transmitter,

applying to the receiver the output of the transmitter in response to the wide notch filtered test signal, and measuring noise in the resulting receiver demodulated output in the band of said wide notch filter but away from the edges of the wide notch; and

(d) reducing the noise measured in said narrow notch by the noise measured in said wide notch to derive a measure of said oscillator spillover noise.

4,539,710

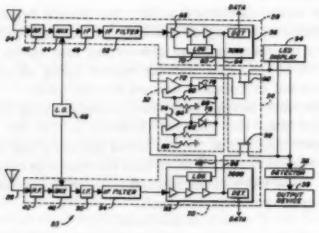
DIVERSITY TELEMETRY RECEIVER HAVING PLURAL SPACED ANTENNAS

Mark T. Dinsmore, Newton, Mass., assignor to Transkinetics Systems, Inc., Canton, Mass.

Filed Sep. 30, 1983, Ser. No. 537,488

Int. Cl.[3] H04B 7/08, 1/16

U.S. Cl. 455—134 **11 Claims**



1. A diversity telemetry receiver for use with a plurality of spaced antennas, comprising:

a plurality of channels, each responsive to RF FM modulated signals received at a corresponding one of said antennas;

means connected to said plurality of channels for converting each RF signal into the corresponding IF signal;

means coupled to said plurality of channels and operative in response to an associated one of said IF signals to provide a like plurality of signals each representative of the logarithm of a corresponding one of said IF signals;

means coupled to said plurality of channels and operative in response to said signals each representative of the logarithm of a corresponding one of said IF signals to provide a like plurality of control signals each having an identifiable characteristic that denotes the relative strength of the corresponding channel;

said control signal providing means including a like plurality of differential-input single-output operational amplifiers each having one input responsive to the logarithmic magnitude of the IF signal of an associated channel, a rectifying means connected to the output of a corresponding operational amplifier, a feedback circuit connected to the other input of an associated operational amplifier and to the output of the corresponding rectifying means, and a common bus connected to the output of the rectifying means;

means for providing FM demodulation; and

means coupled to said plurality of channels and operative in response to said plurality of control signals for applying the received signal for the channel having the strongest received signal to said demodulation means.

4,539,711

TUNING CONTROL SYSTEM FOR A PAIR OF TUNERS EMPLOYING A COMMON CHANNEL SKIP MEMORY

Mark A. Harger, Noblesville, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed May 2, 1983, Ser. No. 490,720

Int. Cl.[3] H04B 1/16

U.S. Cl. 455—166 **4 Claims**

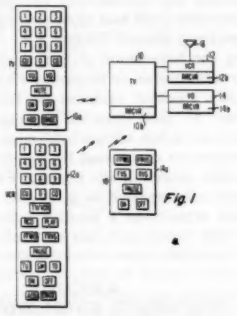


Fig. 1

4. Apparatus for controlling first and second tuners, comprising:

first and second selection means;

a plurality of addressable skip memory means each for storing a skip indication indicating that a corresponding channel is not to be tuned or a no-skip indication indicating that a corresponding channel is to be tuned;

first last channel memory means for storing a representation of the last channel tuned by said first tuner;

second last channel memory means for storing a representation of the last channel tuned by said second tuner;

control means for (1) responsive to the activation of said first selection means and the contents of said first last channel memory means, addressing said plurality of skip memory means in a given order from the one of said plurality of skip memory means corresponding to the last channel tuned by said first tuner or responsive to the activation of said second selection means and the contents of said second last channel memory means, addressing said plurality of skip memory means in said given order from the one of said plurality of skip memory means corresponding to the last channel tuned by said second tuner; (2) responsive to

the contents of a presently addressed one of said plurality of skip memory means, causing the next one of said plurality of skip memory means in said given order to be addressed if said presently addressed one of said plurality of skip memory means contains a skip indication or stopping the addressing of said plurality of skip memory means if said presently addressed one of said plurality of skip memory means contains a no-skip indication; and (3) causing the storage of the channel representation corresponding to the one of said plurality of skip memory means at which addressing was stopped to be stored in said first last channel memory means as said representation of said last channel tuned by said first tuner if said first selection means was activated or in said second last channel memory means if said second selection means as said representation of said last channel tuned by said second tuner was activated.

4,539,712

DELAY CIRCUIT

Tatsuo Ito, Kobe, Japan, assignor to Fujitsu-Ten, Ltd., Kobe, Japan

PCT No. PCT/JP79/00023, § 371 Date Sep. 24, 1979, § 102(e) Date Sep. 24, 1979, PCT Pub. No. WO79/00564, PCT Pub. Date Aug. 23, 1979

PCT Filed Jan. 30, 1979, Ser. No. 187,842

Claims priority, application Japan, Jan. 30, 1978, 53-9962[U]

Int. Cl.³ H04B *1/16*

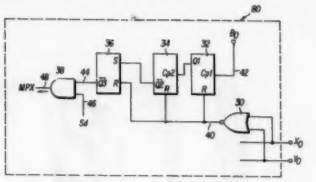
U.S. Cl. 455—184 **4 Claims**

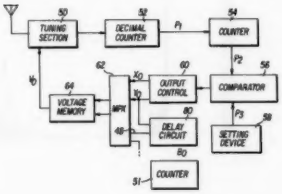
1. An integrated digital delay circuit for use in an automatic channel selecting radio receiver having an output control signal for the increase or decrease of the tuning section frequency in response to a digital comparison of the measured tuning section frequency and a preselected digital frequency wherein said integrated digital delay circuit is provided in order to delay an automatic switching from a digital channel selection mode to one of a receiving mode or another channel selection mode upon the cessation of said output control signal and wherein said digital delay circuit comprises:

a counter having a cascade connection of a plurality of flip-flop circuits;

a separate flip-flop circuit which is set by the output from said counter when said counter reaches a predetermined number;

a gating circuit being fed by said output control signal and which outputs a signal for maintaining said counter and said flip-flop circuits in their reset states when said output control signal is in a first state; and





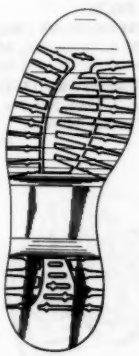
a second gating circuit which is inputted with a digital channel selection indication signal and is controlled by the output from said separate flip-flop circuit in order to provide switching from a digital channel selection mode to one of a receiving mode or another channel selection mode a predetermined time after the cessation of said output control signal.

DESIGNS

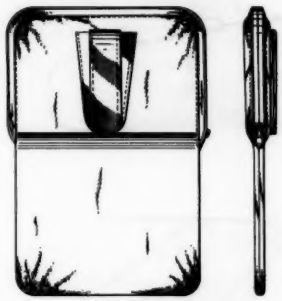
SEPTEMBER 3, 1985

280,355
SHOE SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Rubber Company, North Brookfield, Mass.
Filed Apr. 29, 1983, Ser. No. 490,242
Term of patent 14 years
U.S. Cl. D2—320

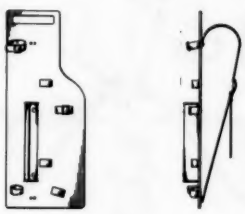
280,356
SHOE SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Rubber Company, North Brookfield, Mass.
Filed May 10, 1983, Ser. No. 493,249
Term of patent 14 years
U.S. Cl. D2—320



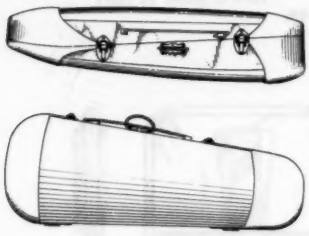
280,357
BELT POUCH
Terry Scheller, 216 Pleasant St., Newton Centre, Mass. 02159
Filed Jun. 1, 1982, Ser. No. 383,798
Term of patent 14 years
U.S. Cl. D2—400



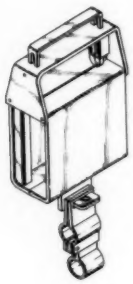
280,358
TOOL CARRIER
Charles R. Stewart, Apt. 3-A, 6726 Tara Blvd., Jonesboro, Ga. 30236
Filed May 13, 1983, Ser. No. 494,518
Term of patent 14 years
U.S. Cl. D2—400

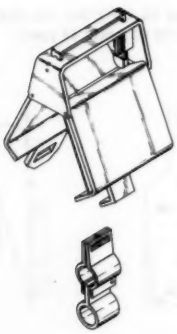


280,359
VIOLIN CASE
Robert L. Bohunsky, 111 Saginaw St., Vassar, Mich. 48768
Filed Dec. 28, 1982, Ser. No. 432,284
Term of patent 14 years
U.S. Cl. D3—30.1



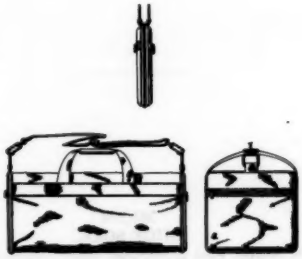
280,360
SKI AND SKI POLE CARRIER
John Fields, Jr., Haverhill, Mass., assignor to Ski Accessories, Inc., Haverhill, Mass.
Filed Feb. 2, 1983, Ser. No. 463,253
Term of patent 14 years
U.S. Cl. D3—36





280,361
TOY CONTAINER
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Feb. 18, 1982, Ser. No. 349,986
Term of patent 14 years
U.S. Cl. D3—66

280,362
EXPANDABLE HAND AND SHOULDER DUFFLE BAG
James H. Allen, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio
Filed Apr. 18, 1983, Ser. No. 486,052
Term of patent 14 years
U.S. Cl. D3—71

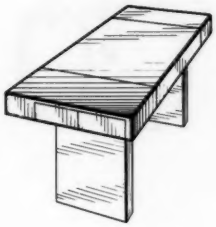


280,363
PHOTOGRAPH DISPLAY FRAME
Wilbur V. Wisecup, Jr., 9285 S. Union Rd., Miamisburg, Ohio 45342
Continuation of Ser. No. 292,559, Aug. 13, 1981, abandoned.
This application Apr. 2, 1984, Ser. No. 595,755
Term of patent 14 years
U.S. Cl. D6—301

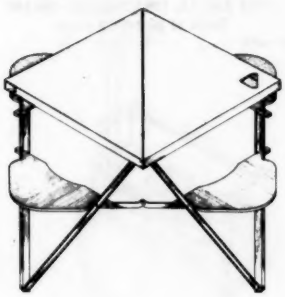
280,364
SEAT
Hans Hopfer, Paris, France, assignor to Alex Synn AG, Cham, Switzerland
Filed Dec. 28, 1982, Ser. No. 454,102
Claims priority, application Hague, Jun. 30, 1982, DM/001,596
Term of patent 14 years
U.S. Cl. D6—334

280,365
SOFA
Hans Hopfer, Paris, France, assignor to Alex Synn AG, Cham, Switzerland
Filed Dec. 28, 1982, Ser. No. 454,103
Claims priority, application Hague, Jun. 30, 1982, DM/001,596
Term of patent 14 years
U.S. Cl. D6—334

280,366
DESK WITH FOLDABLE TOP
Hari Matsuda, Evanston, Ill., assignor to Hari & Associates, Inc., Skokie, Ill.
Filed Sep. 20, 1982, Ser. No. 420,406
Term of patent 14 years
U.S. Cl. D6—425

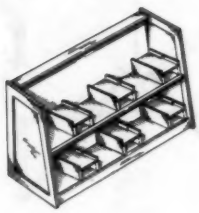


280,367
COMBINED FOLDABLE TABLE AND MULTIPLE SEAT UNIT
Howard J. Reamer, Jr., Rte. 1, Box 103 B, Clarksburg, Calif. 95612, and Forrest W. Dick, 2125 W. Capitol Ave., West Sacramento, Calif. 95691
Filed May 9, 1983, Ser. No. 492,961
Term of patent 14 years
U.S. Cl. D6—429



280,368
ADJUSTABLE TABLE
Gabriella Crespi, Via Montenapoleone, 2 Milan, Italy
Filed Mar. 8, 1983, Ser. No. 473,323
Claims priority, application Italy, Sep. 15, 1982, 22876/82[U]
Term of patent 14 years
U.S. Cl. D6—430

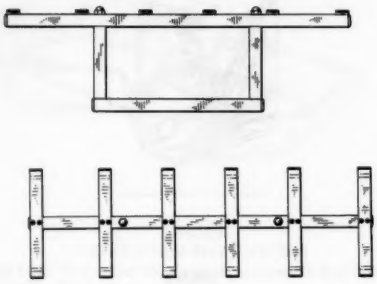
280,369
DISPLAY RACK FOR STATIONERY SETS
Mark T. Stevens, 351 Kristina Ct., Centerville, Ohio 45459
Filed Apr. 13, 1983, Ser. No. 484,168
Term of patent 14 years
U.S. Cl. D6—468



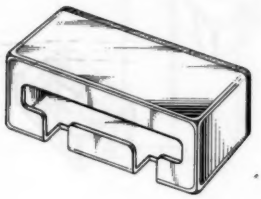
280,370
UTILITY STAND
Irwin J. Ferdinand, Glencoe; Milton C. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Sep. 29, 1983, Ser. No. 537,173
The portion of the term of this patent subsequent to Jul. 23, 1989, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—477

280,371
TABLE OR THE LIKE
Peter K. Bayly, Kangaroo Ground, Australia, assignor to Roplas Pty. Ltd., Collingwood, Australia
Filed Mar. 22, 1983, Ser. No. 477,829
Claims priority, application Australia, Oct. 8, 1982, 1791/82
Term of patent 14 years
U.S. Cl. D6—484

280,372
DISPLAY RACK ATTACHMENT FOR SMALL PACKAGED ARTICLES OR THE LIKE
Steven C. Kuechler, 8211 Valley View Dr., Overland Park, Kans. 66204, and Mark E. Raspotnik, 8235 Switzer, Overland Park, Kans. 66210
Filed Jul. 14, 1982, Ser. No. 397,975
Term of patent 14 years
U.S. Cl. D6—509

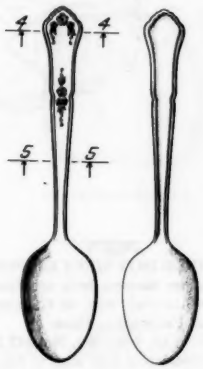


280,373
STORAGE RACK FOR SAFETY RAZORS
Peter Ioakim, 123 Marine Dr., Pensacola, Fla. 32507
Filed May 26, 1982, Ser. No. 381,939
Term of patent 14 years
U.S. Cl. D6—526

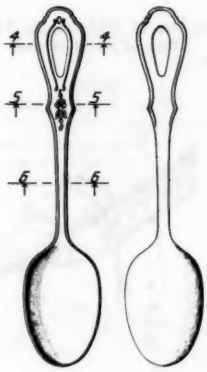


280,374
CANDY DISPENSER
Jeffrey D. Breslow, Highland Park; Donald A. Rosenwinkel, and John V. Zaruba, both of Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Jun. 13, 1982, Ser. No. 407,993
Term of patent 14 years
U.S. Cl. D7—76

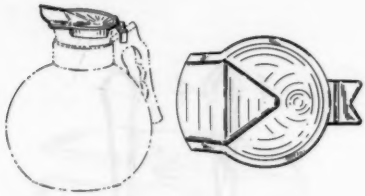
280,375
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed May 19, 1983, Ser. No. 496,251
Term of patent 14 years
U.S. Cl. D7—137



280,376
SPOON OR SIMILAR ARTICLE
Frank R. Perry, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Sep. 22, 1983, Ser. No. 534,815
Term of patent 14 years
U.S. Cl. D7—137



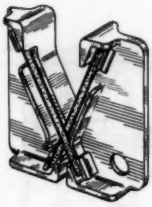
280,377
POT COVER
Henry L. Foley, Chatham, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.
Filed Feb. 28, 1983, Ser. No. 470,312
Term of patent 14 years
U.S. Cl. D7—391



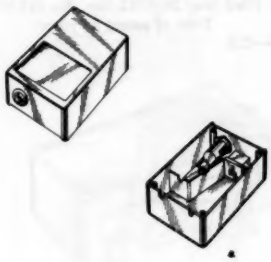
280,378
HAND HELD HOT MELT DISPENSER
Octavio Nuesse; Rainer Samson, both of Muenster, and Karl Majert, Herne, all of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.
Filed Nov. 16, 1982, Ser. No. 442,175
Claims priority, application Fed. Rep. of Germany, May 17, 1982, 10 MR607
Term of patent 14 years
U.S. Cl. D8—30

280,379
REVERSIBLE ELECTRIC DRILL
Robert I. Somers, Raleigh, N.C., assignor to Black & Decker, Inc., Del.
Filed Aug. 15, 1983, Ser. No. 523,064
Term of patent 14 years
U.S. Cl. D8—61

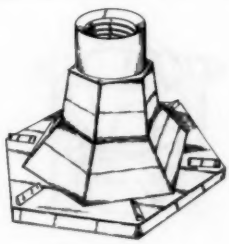
280,380
SHARPENING APPARATUS
Louis N. Graves, Anoka, Minn., assignor to Louis N. Graves Company, Inc., Anoka, Minn.
Filed May 2, 1983, Ser. No. 490,775
Term of patent 14 years
U.S. Cl. D8—91



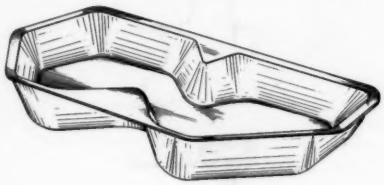
280,381
CASING FOR A POWER LOCK
Loren A. Schultz, 1617 Kenmare Dr., Dresher, Pa. 19025
Filed Mar. 17, 1982, Ser. No. 359,176
Term of patent 14 years
U.S. Cl. D8—330



280,382
PALLET NUT
Paul Rossi, New York, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jan. 13, 1983, Ser. No. 457,633
Term of patent 14 years
U.S. Cl. D8—397



280,383
PACKAGING TRAY
Edwin W. Tendick, Greer, S.C., and Richard H. Kasting, Kutztown, Pa., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.
Filed Mar. 14, 1983, Ser. No. 475,411
Term of patent 14 years
U.S. Cl. D9—345

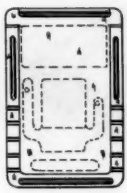


280,384
CONTAINER FOR LIQUIDS
Albert C. G. Poore, Surrey, England, assignor to Sterling-Drug, Inc., New York, N.Y.
Filed Jan. 12, 1983, Ser. No. 457,397
Claims priority, application United Kingdom, Jul. 14, 1982, 1,007,741
Term of patent 14 years
U.S. Cl. D9—370

280,385
BOTTLE
Pierre Dinand, Levallois, France, assignor to Saint Gobain Desjonqueres, Courbevoie, France
Filed Apr. 15, 1982, Ser. No. 368,595
Claims priority, application France, Oct. 16, 1981, 813.575
Term of patent 14 years
U.S. Cl. D9—403

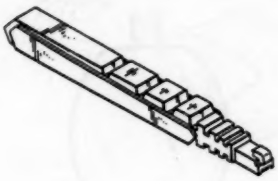
280,386
BOTTLE
Pierre Dinand, Levallois, France, assignor to Saint Gobain Desjonqueres, Courbevoie, France
Filed Apr. 15, 1982, Ser. No. 368,596
Claims priority, application France, Oct. 16, 1981, 813575
Term of patent 14 years
U.S. Cl. D9—403

280,387
HANGING PANEL FOR A DISPENSING PACKAGE
John H. Morgan, Chatham, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 29, 1982, Ser. No. 426,430
Term of patent 14 years
U.S. Cl. D9—415

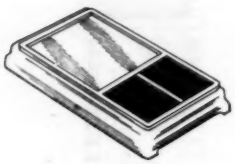


280,388
BROADBAND PROBE
Edward E. Aslan, Plainview, N.Y., assignor to The Narda Microwave Corporation, Hauppauge, N.Y.
Filed Jan. 27, 1983, Ser. No. 461,578
Term of patent 14 years
U.S. Cl. D10—78

280,389
TELEPHONE LINE TEST PROBE
Hollis B. Austin, Manchester, N.H., assignor to Northern Telecom Limited, Montreal, Canada
Filed Apr. 21, 1983, Ser. No. 487,059
Term of patent 14 years
U.S. Cl. D10—78



280,390
MOTION DETECTOR CASE
John C. Schweitzer, Grand Junction, Colo., assignor to Delta Products, Inc., Grand Junction, Colo.
Filed Sep. 26, 1983, Ser. No. 535,853
Term of patent 14 years
U.S. Cl. D10—106



280,391
STAR JEWELRY ORNAMENT OR THE LIKE
Alan Y. T. Lee, 24 Ferncliff Rd., Coscob, Conn. 06807
Filed Mar. 11, 1983, Ser. No. 474,707
Term of patent 14 years
U.S. Cl. D11—70

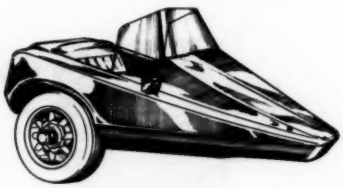
280,392
STAR JEWELRY ORNAMENT OR THE LIKE
Alan Y. T. Lee, 24 Ferncliff Rd., Coscob, Conn. 06807
Filed Mar. 11, 1983, Ser. No. 474,708
Term of patent 14 years
U.S. Cl. D11—70

280,393
STAR JEWELRY ORNAMENT OR THE LIKE
Alan Y. T. Lee, 24 Ferncliff Rd., Coscob, Conn. 06807
Filed Mar. 11, 1983, Ser. No. 474,709
Term of patent 14 years
U.S. Cl. D11—70

280,394
STAR JEWELRY ORNAMENT OR THE LIKE
Alan Y. T. Lee, 24 Ferncliff Rd., Coscob, Conn. 06807
Filed Mar. 11, 1983, Ser. No. 474,710
Term of patent 14 years
U.S. Cl. D11—70

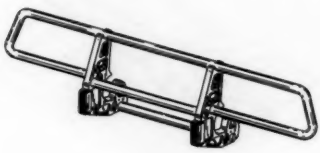
280,395
ADJUSTABLE HOLDER FOR FLOWERS, PLANTS OR THE LIKE
Jung-Tsung Cheng, 57-10, Suiyuan 2nd St., Kaohsiung City, Taiwan (800), and Alan Y. T. Lee, 24 Ferncliff Rd., Coscob, Conn. 06807
Filed Jul. 5, 1983, Ser. No. 510,924
Term of patent 14 years
U.S. Cl. D11—146

280,396
MOTORCYCLE SIDE CAR
James A. Sontag, 3620 Angelus St., Glendale, Calif. 91208
Filed Apr. 19, 1982, Ser. No. 369,158
Term of patent 14 years
U.S. Cl. D12—116

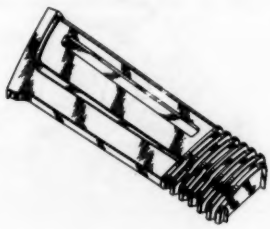


280,397
BICYCLE TIRE
Eiji Fukuchi, Kagawa, Japan, assignor to Mitsuboshi Belting Ltd., Japan
Filed Mar. 9, 1983, Ser. No. 473,691
Claims priority, application Japan, Jan. 13, 1983, 58-1124
Term of patent 14 years
U.S. Cl. D12—136

280,398
BUMPER GUARD
John L. Milton, 473 Shannon Way, Vancouver, Canada
Filed Feb. 25, 1983, Ser. No. 469,890
Term of patent 14 years
U.S. Cl. D12—171



280,399
BUMPER EXTENSION
Jan Wilsgaard, Kullavik, Sweden, assignor to Aktiebolaget Volvo, Gothenburg, Sweden
Filed Jun. 30, 1982, Ser. No. 393,703
Claims priority, application Sweden, Dec. 30, 1981, 81-3068
Term of patent 14 years
U.S. Cl. D12—172

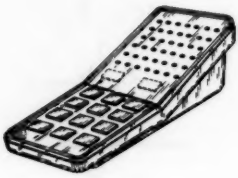


280,400
REGISTRATION PLATE MOUNTING FOR AUTOMOBILE
Claus Luthe, Munich, and Boyke Boyer, Seefeld, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany
Filed Mar. 9, 1983, Ser. No. 473,730
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, MR 13154
Term of patent 14 years
U.S. Cl. D12—193

280,401
TERMINAL PIN
Trevor Armistead, Ulverston, England, assignor to Oxley Developments Company Limited, London, England
Filed Sep. 22, 1982, Ser. No. 421,708
Claims priority, application United Kingdom, Mar. 26, 1982, 1005829
Term of patent 14 years
U.S. Cl. D13—24

280,402
COMBINED TELEPHONE AND CLOCK RADIO
Paul R. Brown, 20 E. 35th St., New York, N.Y. 10016
Filed Apr. 25, 1983, Ser. No. 488,228
Term of patent 14 years
U.S. Cl. D14—53

280,403
MODULAR LOUDSPEAKING TELEPHONE UNIT
Michael Mitchell, Huntsville, Ala., assignor to GTE Business Communication Systems, Northlake, Ill.
Filed May 2, 1983, Ser. No. 490,830
Term of patent 14 years
U.S. Cl. D14—53

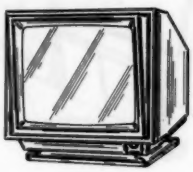


280,404
TELEPHONE SET
Hiroshi Inaba, Yokohama, Japan, assignor to Nippon Tsushin Kogyo Kabushiki Kaisha, Kanagawa, Japan
Filed Apr. 29, 1983, Ser. No. 490,144
Claims priority, application Japan, Feb. 1, 1983, 58-3329
Term of patent 14 years
U.S. Cl. D14—58

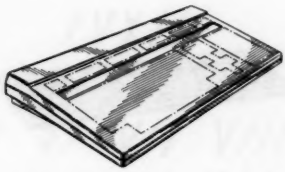
280,405
MODULAR TELEPHONE BASE UNIT
Michael Mitchell, Huntsville, Ala., assignor to GTE Business Communication Systems Inc., Northlake, Ill.
Filed May 2, 1983, Ser. No. 490,828
Term of patent 14 years
U.S. Cl. D14—62

280,406
SINGLE KEY STROKE INSTANT PROGRAMMING CONTROLLER
Alexander D. R. Walker, Los Gatos, Calif., assignor to Dyna Electronics, Inc., Santa Clara, Calif.
Filed Sep. 13, 1982, Ser. No. 417,097
Term of patent 14 years
U.S. Cl. D14—100

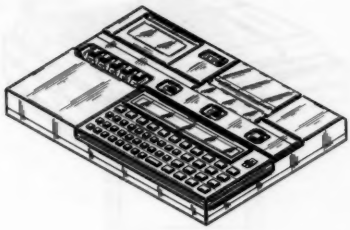
280,407
COMPUTER DISPLAY
Junichi Sakamoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 14, 1983, Ser. No. 504,299
Claims priority, application Japan, Dec. 14, 1982, 57-56205
Term of patent 14 years
U.S. Cl. D14—113



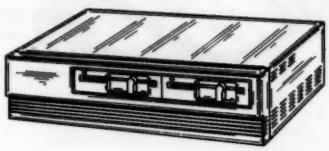
280,408
KEYBOARD
Lawrence M. Kuba, Nashua, N.H., assignor to Wang Laboratories, Inc., Lowell, Mass.
Filed Dec. 27, 1982, Ser. No. 453,042
Term of patent 14 years
U.S. Cl. D14—100



280,409
PERSONAL COMPUTER
Kazuo Yamada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 14, 1983, Ser. No. 474,787
Claims priority, application Japan, Oct. 14, 1982, 57-46736
Term of patent 14 years
U.S. Cl. D14—100

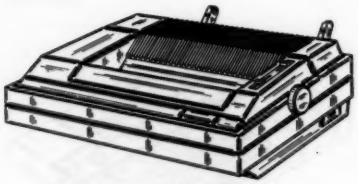


280,410
PROCESSOR UNIT FOR USE WITH COMPUTERS
Junichi Sakamoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 14, 1983, Ser. No. 504,297
Claims priority, application Japan, Dec. 14, 1982, 57-56207
Term of patent 14 years
U.S. Cl. D14—100

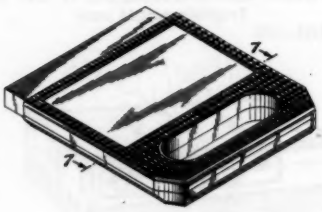


280,411
COMPUTER INPUT UNIT
Junichi Sakamoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 14, 1983, Ser. No. 504,298
Claims priority, application Japan, Dec. 14, 1982, 57-56206
Term of patent 14 years
U.S. Cl. D14—100

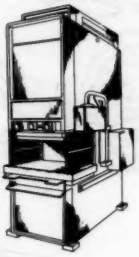
280,412
PRINTER
Junichi Sakamoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 25, 1982, Ser. No. 436,297
Claims priority, application Japan, Apr. 27, 1982, 57-18581
Term of patent 14 years
U.S. Cl. D14—111



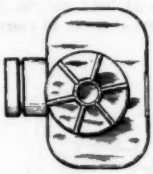
280,413
COMPUTER CARTRIDGE
Gary E. Grimes, Watertown, Conn., assignor to Timex Computer Corporation, Waterbury, Conn.
Filed May 27, 1983, Ser. No. 499,058
Term of patent 14 years
U.S. Cl. D14—114



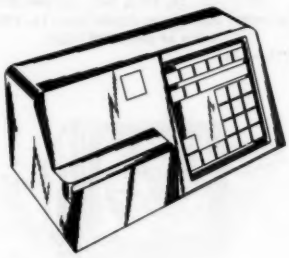
280,414
HYDRAULIC PRESS
Miroslav Uroshevich, Cincinnati, Ohio, assignor to Cincinnati Incorporated, Harrison, Ohio
Filed May 5, 1983, Ser. No. 491,911
Term of patent 14 years
U.S. Cl. D15—123



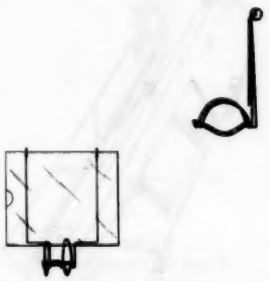
280,415
PORTABLE HAND-HELD VIEWING APPARATUS
Joseph V. Urbano, New Providence, N.J.; Jeshayahu Klein, and Israel Schield, both of Brooklyn, N.Y., assignors to Amereader Inc., Greenbrook, N.J.
Filed Jan. 28, 1983, Ser. No. 461,987
Term of patent 14 years
U.S. Cl. D16—17



280,416
COPIER CONTROL DEVICE OR SIMILAR ARTICLE
Gary L. Switser, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 21, 1983, Ser. No. 506,185
Term of patent 14 years
U.S. Cl. D16—32

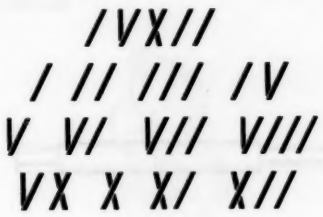


280,417
FLUTE AND PICCOLO PLAYER'S LYRE
George T. Koprivica, 147 E. Alton Ave., East Alton, Ill. 62024
Filed May 12, 1983, Ser. No. 494,001
Term of patent 14 years
U.S. Cl. D17—99



280,418
ELECTRONIC PRINTING CALCULATOR
Shigeaki Hayashi; Masaji Sawada; Hiroshi Sakaguchi, and Kazuo Yamada, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jan. 5, 1983, Ser. No. 455,822
Term of patent 14 years
U.S. Cl. D18—7

280,419
ROMAN NUMERAL ELECTRO-OPTICAL DISPLAY
Harry M. Landis, 207 Oak St., Norton, Mass. 02766
Filed Jul. 9, 1982, Ser. No. 396,737
Term of patent 14 years
U.S. Cl. D18—26

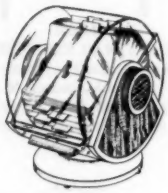


280,420
BALL-POINT PEN
Jean-Paul G. L. Verhaegue, Saint-Herblain, France, assignor to Waterman S.A., Paris, France
Filed Apr. 13, 1983, Ser. No. 484,535
Claims priority, application France, Nov. 22, 1982, 82 4033
Term of patent 14 years
U.S. Cl. D19—48

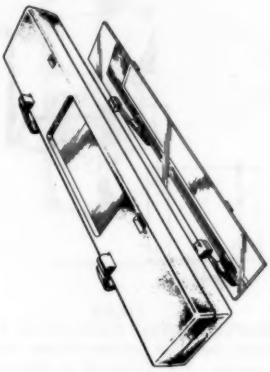
280,421
WRITING INSTRUMENT
Giorgetto Giugiaro, Turin, Italy, assignor to The Parker Pen Company Limited, Newhaven, England
Filed May 23, 1983, Ser. No. 497,406
Claims priority, application United Kingdom, Nov. 30, 1982, 1 010 029
Term of patent 14 years
U.S. Cl. D19—49

280,422
FOUNTAIN PEN
Brian A. J. Booker, East Sussex, England, and Thomas W. Hillebrand, Janesville, Wis., assignors to The Parker Pen Company, Janesville, Wis.
Filed Sep. 26, 1983, Ser. No. 535,894
Term of patent 14 years
U.S. Cl. D19—51

280,423
COVERED SWIVEL CARD FILE
Robert W. Burton, Franklin Lakes; Joseph C. Crowley, Jr., Summit; Richard A. Davi, Glenwood, all of N.J., and Albrecht Goertz, New York, N.Y., assignors to Rolodex Corporation, Secaucus, N.J.
Filed Oct. 5, 1981, Ser. No. 308,482
Term of patent 14 years
U.S. Cl. D19—76



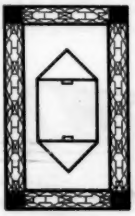
280,424
DISPLAY DEVICE
Hugo K. Krop, Amsterdam, Netherlands, assignor to Text Lite BV, Amsterdam, Netherlands
Filed Jul. 26, 1982, Ser. No. 401,730
Term of patent 14 years
U.S. Cl. D20—10



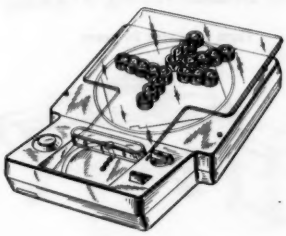
280,425
BUS STOP INFORMATION MARKING POST
Gerard N. Tuduri, 3 rue des Francs Bourgeois, 75003 Paris, France
Filed Apr. 13, 1983, Ser. No. 484,515
Claims priority, application Int. Pat. Inst., Mar. 28, 1983, DM/002375
Term of patent 14 years
U.S. Cl. D20—10

280,426
GAME TARGET PEG
Jose Ortiz, Los Angeles, Calif., assignor to Toledo Enterprises, Inc., Los Angeles, Calif.
Filed Aug. 11, 1981, Ser. No. 291,975
Term of patent 14 years
U.S. Cl. D21—4

280,427
GAME CARD BACK
Karen K. Jones, P.O. Box 24, Whitehouse, N.J. 08888
Filed Jan. 27, 1983, Ser. No. 461,463
Term of patent 14 years
U.S. Cl. D21—47

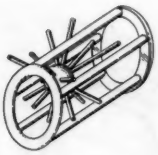


280,428
DRAWING TOY
Melvin Kennedy, New York, N.Y.; Dietmar Nagel, Chester, N.J., and Avi Arad, Westport, Conn., assignors to Nagel/-Kennedy & Associates, New York, N.Y.
Filed Sep. 30, 1982, Ser. No. 431,737
Term of patent 14 years
U.S. Cl. D21—59

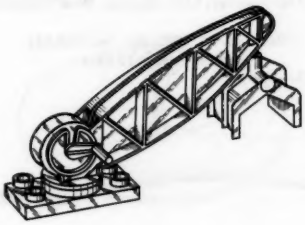


280,429
TOY RATTLE
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Surrey, England
Filed May 2, 1983, Ser. No. 490,875
Claims priority, application United Kingdom, Nov. 12, 1982, 1009668
Term of patent 14 years
U.S. Cl. D21—65

280,430
PUZZLE TOY
Edward Holman, 624 Colonial Arms Rd., Union, N.Y. 07083
Filed Jan. 31, 1983, Ser. No. 462,348
Term of patent 14 years
U.S. Cl. D21—104



280,431
TOY CRANE FOR CONSTRUCTION SET OR SIMILAR ARTICLE
Erik P. Tapdrup, Virum, and Sven Carsten B. Thomsen, Naestved, both of Denmark, assignors to Interlego A.G., Baar, Switzerland
Filed Dec. 10, 1982, Ser. No. 448,754
Term of patent 14 years
U.S. Cl. D21—108

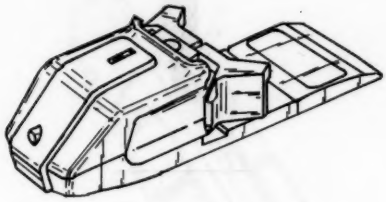


280,432
TOY CONSTRUCTION PIECE
Erik P. Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 10, 1982, Ser. No. 448,755
Term of patent 14 years
U.S. Cl. D21—108

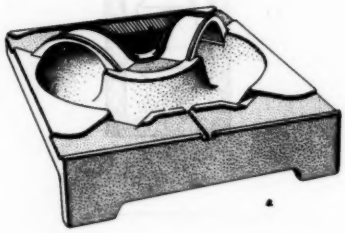
280,433
BARBELL LOCK
Tom I. Lincir, San Pedro, Calif., assignor to Ivanko Barbell Company, San Pedro, Calif.
Filed Feb. 9, 1983, Ser. No. 465,178
Term of patent 14 years
U.S. Cl. D21—191

280,434
INFLATED HAND EXERCISER
C. Chalmer McManaway, 1310 Glen Rd., West Palm Beach, Fla. 33406
Filed Jun. 21, 1983, Ser. No. 506,521
Term of patent 14 years
U.S. Cl. D21—198

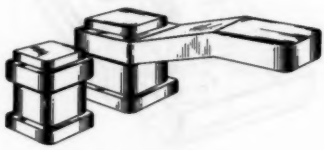
280,435
SKI TOE CLAMP
Herbert H. Schultes, Fürstenfeldbruck, and Edwin Wahl, Munich, both of Fed. Rep. of Germany, assignors to Marker International Company, Salt Lake City, Utah
Filed May 3, 1982, Ser. No. 374,291
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, MR 18 675
Term of patent 14 years
U.S. Cl. D21—230



280,436
TOY SANDBOX COVER
James F. Mariol, 481 Dean View Dr., Cincinnati, Ohio 45224
Filed Apr. 21, 1983, Ser. No. 487,174
Term of patent 14 years
U.S. Cl. D21—252

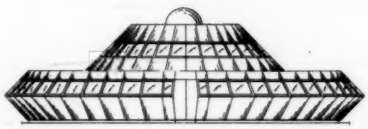


280,437
COMBINED FAUCET HANDLE AND SPOUT
Manfred Rademacher, Freiligrathstrasse 19, 4 Dusseldorf, Fed. Rep. of Germany
Filed Feb. 22, 1983, Ser. No. 468,856
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 5177
Term of patent 14 years
U.S. Cl. D23—23



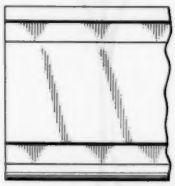
280,438
HOT TUB COVER
Gary R. Wendt, 1208 California St., Huntington Beach, Calif. 92648
Filed May 4, 1983, Ser. No. 491,586
Term of patent 14 years
U.S. Cl. D23—71

280,439
BUILDING
Gregg A. Sanford, 1032 Vine St., St. Charles, Mo. 63301
Filed Mar. 14, 1983, Ser. No. 474,800
Term of patent 14 years
U.S. Cl. D25—11

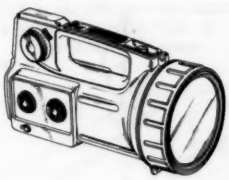


280,440
ADJUSTABLE TRESTLE
Robert D. Gromer, Jr., Wyandotte County, Kans., assignor to Goldblatt Tool Co., Kansas City, Kans.
Filed Jan. 24, 1983, Ser. No. 460,189
Term of patent 14 years
U.S. Cl. D25—67

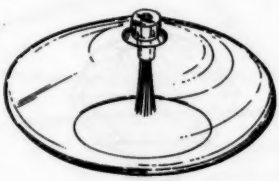
280,441
ELONGATED EXTRUSION
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Mar. 21, 1983, Ser. No. 476,927
Term of patent 14 years
U.S. Cl. D25—74



280,442
COMBINED LIGHT AND RADIO RECEIVER
Keiichi Ohashi, Shizuoka, Japan, assignor to Skylite Industry Co., Ltd., Japan
Filed Dec. 13, 1982, Ser. No. 449,219
Term of patent 14 years
U.S. Cl. D26—38



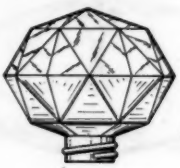
280,443
OIL CANDLE
Karen Boss, 125 HorseShoe Hill Rd., Bolinas, Calif. 94924
Filed Jun. 14, 1983, Ser. No. 504,187
Term of patent 14 years
U.S. Cl. D26—110



280,444
OIL CANDLE
Karen Boss, 125 Horse Shoe Hill Rd., Bolinas, Calif. 94924
Filed Jun. 14, 1983, Ser. No. 504,188
Term of patent 14 years
U.S. Cl. D26—110

280,445
OIL CANDLE
Karen Boss, 125 Horse Shoe Hill Rd., Bolinas, Calif. 94924
Filed Jun. 14, 1983, Ser. No. 504,189
Term of patent 14 years
U.S. Cl. D26—110

280,446
LAMP GLOBE
Motoko Ishii, Meihei Bldg., 6 Rokuban-cho, Chiyoda-ku, Tokyo, Japan
Filed Apr. 4, 1983, Ser. No. 481,889
Term of patent 14 years
U.S. Cl. D26—130

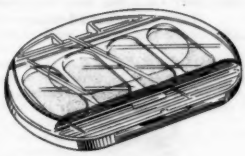


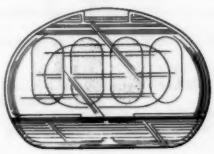
280,447
BARRETTE
Henry A. Verducci, 52 Zella St., Providence, R.I. 02908
Filed May 17, 1982, Ser. No. 379,264
Term of patent 14 years
U.S. Cl. D28—42

280,448
COMBINED BACK SCRUBBER AND BACK SCRATCHER WITH REMOVABLE SPONGE ELEMENT
Aldo Colognori, 69 Lawton Ave., Cliffside Park, N.J. 07010
Filed Nov. 28, 1984, Ser. No. 675,942
Term of patent 14 years
U.S. Cl. D28—63

280,449
COMBINED BACK SCRUBBER AND BACK SCRATCHER WITH REMOVABLE SPONGE ELEMENT
Aldo Colognori, 69 Lawton Ave., Cliffside Park, N.J. 07010
Filed Nov. 28, 1984, Ser. No. 675,943
Term of patent 14 years
U.S. Cl. D28—63

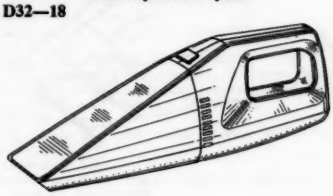
280,450
COSMETIC COMPACT
Eli I. Schefer, Sands Point, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Sep. 13, 1982, Ser. No. 416,800
Term of patent 14 years
U.S. Cl. D28—78



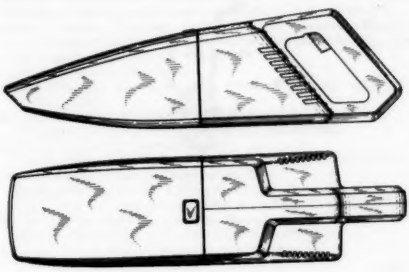


280,451
LIPSTICK CASE
Dieter Bakic, Munich, Fed. Rep. of Germany, assignor to Revlon, Inc., New York, N.Y.
Filed Dec. 15, 1982, Ser. No. 449,847
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1982, 11 AR 2344/82
Term of patent 14 years
U.S. Cl. D28—88

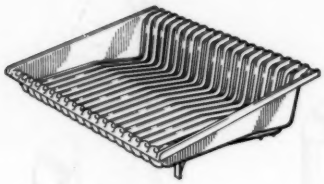
280,452
HAND-HELD VACUUM CLEANER
Toyomi Arita, Hyogo, Japan, assignor to Sanyo Electric Co., Ltd., Japan
Filed Sep. 14, 1983, Ser. No. 532,197
Claims priority, application Japan, Mar. 15, 1983, 58-10723
Term of patent 14 years
U.S. Cl. D32—18



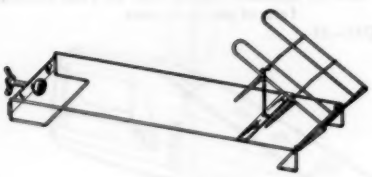
280,453
HAND-HELD VACUUM CLEANER
Masao Tsuji, Old Lyme, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Jul. 6, 1983, Ser. No. 511,123
Term of patent 14 years
U.S. Cl. D32—18



280,454
DISH DRAINER
Karl A. Andersson, and Morgan Ferm, both of Malmo, Sweden, assignors to Perstop AB, Perstorp, Sweden
Filed Jun. 7, 1983, Ser. No. 501,817
Claims priority, application Sweden, Dec. 22, 1982, 82-3057
Term of patent 14 years
U.S. Cl. D32—55

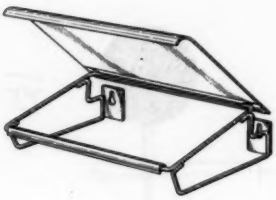


280,455
IRON HOLDER
Martin A. Negrich, 7 Edwards Rd., Portland, Conn. 06480
Filed Feb. 16, 1983, Ser. No. 467,093
Term of patent 14 years
U.S. Cl. D32—73



280,456
DUSTPAN
Thomas H. Malone, 803 Fitt Ct., Lorton, Va. 22079
Filed Jan. 18, 1983, Ser. No. 459,023
Term of patent 14 years
U.S. Cl. D32—74

280,457
WASTE BAG HOLDER
Douglas K. Gatward, 1212 Great Cambridge Rd., Enfield, Middlesex, England
Filed Apr. 20, 1983, Ser. No. 486,699
Term of patent 14 years
U.S. Cl. D34—6



280,458
LITTER BIN
Ian R. Bryce, 2/15 Rockley Rd., South Yarra, Victoria, 3141, Australia
Filed May 23, 1983, Ser. No. 496,389
Term of patent 14 years
U.S. Cl. D34—7

280,459
WASTE RECEPTACLE
Donald R. McClelland, Vancouver, Wash., assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 13, 1983, Ser. No. 494,412
Term of patent 14 years
U.S. Cl. D34—8

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF SEPTEMBER, 1985

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Ballard, James W., to Jimco Products. Roof ventilator having fluid flow control and method of making same. 4,538,508, Cl. 98-42.170.

Baltsch, Erwin; Gobbels, Heinz-Dieter; Grecksch, Hans; Lassmann, Manfred; Raasch, Hans; and Schlosser, Helmut, to W. Schlafhorst & Co. Method and apparatus for controlling the thread joining process in an open end rotor spinning machine. 4,538,408, Cl. 57-263.000.

Bander, Erzsebet: *See—*
Orban, Erno ; Borvendeg, Janos; Nagy, Laszlo ; Sotinee Tolvay, Marta; and Bander, Erzsebet, 4,539,199, Cl. 424-22.000.

Banks, Robert L.: *See—*
Kukes, Simon G.; and Banks, Robert L., 4,539,308, Cl. 502-243.000.

Banos, Zoltan: *See—*
Takacs, Istvan; Kerey, Gyorgy; Rudolf, Peter; Illes, Janos; Szabo, Bela; Vereczkey, Endre; Banos, Zoltan; Bosits, Gyula; and Czebe, Laszlo , 4,539,111, Cl. 210-179.000.

Baranowski, Kenneth M., to Baranowski, Kenneth M. Boarding ramp. 4,538,314, Cl. 14-71.100.

Barbas, George A.: *See—*
Sheets, Ronald E.; Barbas, George A.; Doering, Howard W., Jr.; and Bjorkman, John R., 4,539,479, Cl. 250-491.100.

Barbetta, Angello J.; Gruber, Robert J.; Isganitis, Louis V.; Law, Kock-Yee; Lin, John W.; Koch, Ronald J.; and Dunn, Steven T., to Xerox Corporation. Developer compositions with infrared absorbing additives. 4,539,284, Cl. 430-110.000.

Barker, A. Paul. Kit for and method of immobilizing the cervical spine. 4,538,601, Cl. 128-89.00R.

Barlow, John: *See—*
Edwards, Michael F.; Barlow, John; Foreman, Frederick A.; and Williams, Gwynne, 4,538,860, Cl. 305-56.000.

Barnett, Loren A.; and Smith, Clayton C. Drainage and insulating material for subterranean walls. 4,538,387, Cl. 52-169.500.

Barnum, Thomas G.; Smart, William A., Jr.; and Mullett, Donald H., to Bradley Corporation. Flood level sensor for fluid filling systems. 4,538,307, Cl. 4-427.000.

Baron, Dieter, to INTERO-Stahl - und Maschinenbau Schmitz GmbH & Co. KG. Characters to a hot steel body. 4,538,546, Cl. 118-697.000.

Barron, Robert R.: *See—*
Miller, Coleman J.; and Barron, Robert R., 4,539,535, Cl. 333-164.000.

Bartenbach, Christian. Nonglare light fixtures for a rod-shaped light source. 4,539,628, Cl. 362-217.000.

Barth, Frederic. Dental hygiene apparatus having a plurality of rotating brushes. 4,538,315, Cl. 15-23.000.

Bartkowski, Charles: *See—*
Hart, Richard A.; and Bartkowski, Charles, 4,539,685, Cl. 372-25.000.

Bartlett, Geoffrey M.; Hofmeister, James P.; and Pring, Edward J., to International Business Machines Corporation. Formatting text/-graphics using plural independent formatting mechanisms. 4,539,653, Cl. 364-900.000.

Bas, Selahattin: *See—*
Herrmann, Bodo; Bastel, Paul; and Bas, Selahattin, 4,539,460, Cl. 219-73.210.

BASF Aktiengesellschaft: *See—*
Degner, Dieter; Hannebaum, Heinz; Siegel, Hardo; and Gramlich, Walter, 4,539,081, Cl. 204-78.000.
Meissner, Ruprecht; and Neth, Norbert, 4,539,309, Cl. 502-247.000.
Mueller, Herbert; and Voges, Dieter, 4,539,415, Cl. 549-475.000.
Pipper, Gunter; Theysohn, Rainer; and Zahradnik, Franz, 4,539,391, Cl. 528-323.000.
Ruland, Alfred; and Reuther, Wolfgang, 4,539,160, Cl. 260-465.00F.

BASF Farben & Fasern AG: *See—*
Geist, Michael, 4,539,218, Cl. 427-27.000.
Geist, Michael; and Ott, Gunther, 4,539,385, Cl. 528-100.000.

Basil, Richard V., Jr.: *See—*
Hudspeth, Thomas; Basil, Richard V., Jr.; and Keeling, Harmon H., 4,539,534, Cl. 333-115.000.

Bastel, Paul: *See—*
Herrmann, Bodo; Bastel, Paul; and Bas, Selahattin, 4,539,460, Cl. 219-73.210.

Batt, Thomas N. Scraper with mitt. 4,538,320, Cl. 15-236.00R.

Batten, Ronald W., to V.S.I. Corporation. Fastener wrenching means. 4,538,483, Cl. 81-56.000.

Bauakademie der Deutschen Demokratischen Republik: *See—*
Kutscher, Fritz; and Zschocke, Christian, 4,538,699, Cl. 180-125.000.

Baumberg, Iosif. Analyzer of impulse processes of heart activity. 4,538,619, Cl. 128-702.000.

Baumberg, Iosif. Hydraulic counting cell. 4,539,471, Cl. 235-201.0PF.

Baxter Travenol Laboratories, Inc.: *See—*
Winchell, David A.; and Fowles, Thomas A., 4,539,172, Cl. 264-515.000.

Bay Mills Limited: *See—*
O'Connor, Terry J.; and Cooper, Ian G., 4,539,254, Cl. 428-236.000.

Bayer Aktiengesellschaft: *See—*
Klotz, Helmut; and Bloch, Klaus, 4,539,082, Cl. 204-93.000.
Muschelknautz, Edgar; Rink, Norbert; and Chalupka, Georg, 4,539,029, Cl. 65-5.000.
Nickel, Horst; and Otten, Hans-Gunter, 4,539,009, Cl. 8-641.000.
Nouvertne , Werner; and Stix, Wolfgang, 4,539,370, Cl. 525-67.000.
Richartz, Adolf; Reichmann, Wolfgang; and Knipp, Ulrich, 4,539,166, Cl. 264-45.100.

Bayerische Motoren Werke AG: *See—*
Cettl, Jindrich, 4,538,333, Cl. 29-240.000.

Bayraktaroglu, Burhan; Kim, Bumman; and Frensley, William, to Texas Instruments Incorporated. Two-port amplifier. 4,539,528, Cl. 330-287.000.

BBC Brown, Boveri & Company, Limited: *See—*
Ammann, Hansruedi; and Horler, Hansulrich, 4,538,969, Cl. 417-407.000.
Brugger, Manfred; and Vogt, Peter, 4,539,168, Cl. 264-102.000.
Koppl, Georg; and Linhofer, Gerhard, 4,539,432, Cl. 174-15.00C.
Saleh, Abdel, 4,538,414, Cl. 60-398.000.

Beacom, Roger R. Seal gasket specifically configured to seal the joint between adjacent oval concrete pipes. 4,538,822, Cl. 277-207.00A.

Beales, Keith J.; Carter, Steve F.; Partington, Sally; and France, Paul W., to British Telecommunications. Method for drying oxide glasses. 4,539,033, Cl. 65-134.000.

Beattie, Thomas R.: *See—*
Biftu, Tesfaye; Hwang, San-Bao; Doebber, Thomas W.; Beattie, Thomas R.; and Shen, Tsung-Ying, 4,539,332, Cl. 514-461.000.

Bechstedt, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Process for production liquid fabric conditioners. 4,539,123, Cl. 252-8.800.

Becker, Carol L., to Celanese Corporation. Staple fiber cutter. 4,538,490, Cl. 83-346.000.

Becker, Jorgen: *See*—
Premel, Ulrich; and Becker, Jorgen, 4,538,676, Cl. 165-145.000.
Beckman Instruments, Inc.: *See*—
Blough, William M., Jr., 4,539,295, Cl. 436-34.000.
Becton, Dickinson and Company: *See*—
Hoffman, Michael A., 4,538,733, Cl. 209-3.100.
Beecham Group p.l.c.: *See*—
Clarke, Brian P.; Harbridge, John B.; and Stirling, Irene, 4,539,202, Cl. 424-114.000.
Milner, Peter H., 4,539,149, Cl. 260-239.100.
Newsome, Peter M.; Mullan, Noel A.; and Marshall, John P., 4,539,319, Cl. 514-222.000.
Beers, Dale M., to General Electric Company. Low modulus one-component RTV compositions and processes. 4,539,367, Cl. 524-731.000.
Beggs, Stanley L.; Riel, Frank J.; and Lawson, Dale W. R., to Rohr Industries, Inc. Honeycomb noise attenuation structure. 4,539,244, Cl. 428-116.000.
Bellin, Jack L.: *See*—
Hartog, Jan J.; Bellin, Jack L.; Knollman, Gilbert C.; and Jonath, Arthur D., 4,538,462, Cl. 73-577.000.
Beloit Corporation: *See*—
Chance, James L.; and Wedel, Gregory L., 4,538,360, Cl. 34-41.000.
Frye, Kenneth G.; and Karis, Arthur T., 4,539,072, Cl. 162-197.000.
Gill, Michael L., 4,538,734, Cl. 209-668.000.
Ben Clements & Sons, Inc.: *See*—
Furutsu, Akira, 4,538,754, Cl. 227-67.000.
Bender, Audrey L., executrix: *See*—
Bender, Charles E., deceased; and Bender, Audrey L., executrix, 4,539,315, Cl. 514-162.000.
Bender, Charles E., deceased; and Bender, Audrey L., executrix, to Dynatech Laboratories, Incorporated. Sublingually absorbable non-toxic aspirin composition. 4,539,315, Cl. 514-162.000.
Benedict, Gary F.; and Eskildsen, Jim, to Garrett Corporation, The. Method and apparatus for laser gear hardening. 4,539,461, Cl. 219-121.00L.
Beneke, Herbert: *See*—
Luecke, Wolfgang; Beneke, Herbert; and Friedrich, Bodo, 4,539,388, Cl. 528-271.000.
Benelli Armi S.p.A.: *See*—
Benelli, Paolo, 4,538,502, Cl. 89-128.000.
Benelli, Paolo, to Benelli Armi S.p.A. Reconversion device for a gun from semi-automatic to pump operation. 4,538,502, Cl. 89-128.000.
Benneche, Tore; Strande, Per; and Undheim, Kjell, to Nyegaard & Co. A/S. Substituted pyrimidin-2-ones and the salts thereof. 4,539,324, Cl. 514-274.000.
Bennett, Terry A.: *See*—
Fecik, Michael T.; Bennett, Terry A.; and Ewing, John J., 4,539,031, Cl. 65-29.000.
Berfield, Robert C.: *See*—
Miller, Jonathan; Wacek, Rudolph W.; Berfield, Robert C.; Meland, Ronald F.; Crevling, Robert L., Jr.; and Lawson, Lonnie B., Jr., 4,538,971, Cl. 417-423.00A.
Berg, B. Alan: *See*—
Dambach, Philip J.; and Berg, B. Alan, 4,538,874, Cl. 339-99.00R.
Dambach, Philip J.; and Berg, B. Alan, 4,538,878, Cl. 339-217.00R.
Berger, Barry D., to Esselte Pendaflex Corporation. Marker storage cassette and holders therefor. 4,538,736, Cl. 211-69.500.
Bergeron, Hervin J., Jr., to Ledet, Stephen J., Jr.; and Elder, James D., part interest to each. Air circulation system and air flow elements therefor. 4,538,507, Cl. 98-31.500.
Bergevin, Benoit: *See*—
Jean, Benoit; Bergevin, Benoit; and Rheault, Fernand, 4,538,591, Cl. 126-433.000.
Bergholt, Steven P.: *See*—
Klopfenstein, King L.; Connors, Robert H.; and Bergholt, Steven P., 4,538,693, Cl. 177-25.000.
Bergstrom, Sheryl L.; and Foutch, Gary L., to United States of America, National Aeronautics and Space Administration. Production of butanol by fermentation in the presence of cocultures of clostridium. 4,539,293, Cl. 435-160.000.
Bergthold, Frederick M., Jr.: *See*—
Laderman, Arnold J.; and Bergthold, Frederick M., Jr., 4,538,635, Cl. 137-114.000.
Berkeley, James E., to Shopsmith, Inc. Cutter head system. 4,538,655, Cl. 144-230.000.
Bernard, Jacques: *See*—
Durot, Jean; and Bernard, Jacques, 4,539,112, Cl. 210-219.000.
Bertiger, Bary R., to Motorola, Inc. Wave soldering in a reducing atmosphere. 4,538,757, Cl. 228-180.100.
Bertrand, Claude, to Centre National de la Recherche Scientifique (CNRS). Method of controlling a combustion flame. 4,538,979, Cl. 431-12.000.
Besedin, Vladlen L.: *See*—
Dzjuba, Vladimir F.; Besedin, Vladlen L.; and Birjukov, Boris N., 4,538,474, Cl. 74-63.000.
Beta II, Incorporated: *See*—
Volk, Joseph A., Jr.; and Volk, Joseph A., 4,538,471, Cl. 73-861.730.
Betz, Wolfgang; and Huther, Werner, to Motoren- und Turbinen-Union Munchen GmbH. Method for sealing a ceramic molding. 4,539,231, Cl. 427-255.000.
Bhagwat, Anil G., to Xerox Corporation. Sheet feeding apparatus. 4,538,799, Cl. 271-9.000.
Bharteey, Brit M.; and Rowe, Neal E., to Westinghouse Electric Corp. Terminal connector assembly for electric control device. 4,539,541, Cl. 335-132.000.
Bianchi, Gianfranco; Pierpaoli, Piero; Borelli, Riccardo; and Rainoldi, Luciano, to Kent-Tieghi S.p.A. Electronic transmitter for transmitting pressure values of industrial process fluids. 4,538,465, Cl. 73-722.000.
Bible, Robert E.; Bible, Robert E., Jr.; and Mason, Richard S., to Automation Engineering, Inc. Circuit board inspection apparatus and method. 4,538,909, Cl. 356-237.000.
Bible, Robert E., Jr.: *See*—
Bible, Robert E.; Bible, Robert E., Jr.; and Mason, Richard S., 4,538,909, Cl. 356-237.000.
Biermans, Andreas J.: *See*—
Jonckers, Kees; Van Nassau, Petrus J. M.; and Biermans, Andreas J., 4,539,077, Cl. 203-49.000.
Biftu, Tesfaye; Hwang, San-Bao; Doebber, Thomas W.; Beattie, Thomas R.; and Shen, Tsung-Ying, to Merck & Co., Inc. 2,5-Diaryl tetrahydrofurans and analogs thereof as PAF-antagonists. 4,539,332, Cl. 514-461.000.
Binder, Jean-Jacques; and Cherbuy, Bernard, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Apparatus for removing excess developer particles on the surface of a recording element. 4,538,321. Cl. 15-306.00R.
Binggeli, Rudolf, to Emil Suter Maschinenfabrik AG. Seam folding machine. 4,538,334, Cl. 29-243.500.
Binnig, Gerd K.; Gerber, Christoph E.; Rohrer, Heinrich; and Weibel, Edmund, to International Business Machines Corporation. Method for depositing material with nanometer dimensions. 4,539,089, Cl. 204-192.00R.
Biochemie Gesellschaft m.b.H.: *See*—
Naschberger, Stefan, 4,539,036, Cl. 71-11.000.
Birchall, Gerrard A.: *See*—
Clifford, Richard P.; and Birchall, Gerrard A., 4,539,071, Cl. 162-161.000.
Birjukov, Boris N.: *See*—
Dzjuba, Vladimir F.; Besedin, Vladlen L.; and Birjukov, Boris N., 4,538,474, Cl. 74-63.000.
Birkin, Michael S., to British Railways Board. Control system for controlling the passage of vehicles. 4,538,781, Cl. 246-187.00B.
Bishop, Lewis A., to Milliken Research Corporation. Optimum pressure control. 4,538,432, Cl. 68-5.00C.
Bissot, Thomas C.; and Li, Stephen, to Du Pont de Nemours, E. I., and Company. Unreinforced membrane, electrochemical cell and electrolysis process. 4,539,084, Cl. 204-98.000.
Bittensky, Joel S.: *See*—
MacLean, John P.; Bittensky, Joel S.; and Colvert, James H., 4,539,303, Cl. 502-39.000.
Bjorkman, John R.: *See*—
Sheets, Ronald E.; Barbas, George A.; Doering, Howard W., Jr.; and Bjorkman, John R., 4,539,479, Cl. 250-491.100.
Black Clawson Company, The: *See*—
Pimley, John J., 4,538,767, Cl. 241-79.300.
Black, Paul W.: *See*—
Pringle, Ronald E.; and Black, Paul W., 4,538,685, Cl. 166-321.000.
Blair, Leslie M., to Du Pont de Nemours, E. I., and Company. Process for polymerizing formaldehyde. 4,539,387, Cl. 528-232.000.
Blakeman, Gordon E.: *See*—
Hamar, Edward K.; and Blakeman, Gordon E., 4,538,392, Cl. 52-582.000.
Blaser, Lawrence M.: *See*—
Wilson, Verne H.; Blaser, Lawrence M.; and Arguello, Leonard E., 4,538,585, Cl. 123-609.000.
Bleeker, Jan J.; Booth, Martin; van Grieken, Madeline G. F. M.; Krijnen, Wilhelmus J.; and van Wijngaarden, Gerhard D., to Shell Oil Company. Borated basic metal salt and lubricating oil composition. 4,539,126, Cl. 252-39.000.
Blessing, Jules C.: *See*—
Burckhardt, Klaus A.; and Blessing, Jules C., 4,539,035, Cl. 65-136.000.
Blessing, Kenneth C. Machine tool leverage control handle. 4,538,479, Cl. 74-528.000.
Blevins, Daniel W.: *See*—
Adelman, Robert W.; and Blevins, Daniel W., 4,538,659, Cl. 157-1.000.
Bloch, Joseph T., to Boeing Company, The. Hand repair tool for curved surfaces. 4,538,946, Cl. 409-179.000.
Bloch, Klaus: *See*—
Klotz, Helmut; and Bloch, Klaus, 4,539,082, Cl. 204-93.000.
Blohm, Knud; and Krogh, Egon, to Danfoss A/S. Control apparatus for a step drive. 4,538,717, Cl. 192-0.094.
Blomqvist, Seppo I.; Saarela, Markku T.; Huhtala, Martti E.; Niska, Raimo A.; and Vaittinen, Hannu A., to Outokumpu Oy. Means for supporting the material under treatment in continuous-action heat treatment furnaces. 4,538,986, Cl. 432-236.000.
Blore, John C. B. Backing material. 4,539,337, Cl. 521-89.000.
Blough, James A. Refuse receptacle with liquid retainer. 4,538,512, Cl. 100-131.000.
Blough, William M., Jr., to Beckman Instruments, Inc. Binary kinetic assay method and apparatus. 4,539,295, Cl. 436-34.000.
Blount, William W.; and Robinette, William M., to Eastman Kodak Company. Unsaturated polyester compositions comprising carboxylated cellulose ester. 4,539,349, Cl. 523-509.000.
BMD Badische Maschinenfabrik Durlach GmbH: *See*—
Kobel, Alfons; and Damm, Norbert, 4,538,664, Cl. 164-37.000.
Bobear, William J., to General Electric Company. Peroxide curing polysiloxane compositions having a high tear strength. 4,539,357, Cl. 524-267.000.
Bock, Sumner D. Air cooling system. 4,538,426, Cl. 62-310.000.

Bodas, Janos; Bakay, Arpad; Papp, Istvan; Palfalvi, Gyorgy; and Kovacs, Gyula, to Energiagazdalkodasi Intezet. Helicoidally finned tubes. 4,538,677, Cl. 165-146.000.

Boddie, James R.; and Thompson, John S., to AT&T Bell Laboratories. Pipelined digital processor arranged for conditional operation. 4,539,635, Cl. 364-200.000.

Boden, Richard M.; and Grim, Claude, to International Flavors & Fragrances Inc. Norbornyl pyridine derivatives, organoleptic uses of same, and the processes for preparing same. 4,539,143, Cl. 252-522.00R.

Boden, Richard M.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,539,142, Cl. 252-522.00R.

Boebel, Manfred; Baier, Manfred; and Buess, Gerhard, to Richard Wolf GmbH. Rectoscope. 4,538,594, Cl. 128-6.000.

Boehringer Ingelheim KG: *See*—
Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Gaida, Wolfram, 4,539,323, Cl. 514-260.000.

Boeing Company, The: *See*—
Bloch, Joseph T., 4,538,946, Cl. 409-179.000.
Goldstein, Sidney E., 4,538,779, Cl. 244-87.000.
Harris, Alfred W., 4,538,843, Cl. 292-113.000.
Norsworthy, Keith H., 4,539,565, Cl. 343-14.000.
Reinhold, Ralph R., 4,538,880, Cl. 350-6.600.
Roe, Richard D., 4,538,780, Cl. 244-123.000.

Boettcher, Barry; and Walker, William R., to Alcusal Incorporated Pty. Ltd. Topical compositions containing copper (II) complexes of 3,5-dioxo-pyrazolidine derivatives and methods of combatting inflammation with them. 4,539,206, Cl. 514-184.000.

Bohnensieker, Franz. Apparatus for automatically producing solutions at predetermined dosages. 4,538,919, Cl. 366-162.000.

Boley, Robert E. Horizontal gas and liquid separator. 4,539,023, Cl. 55-174.000.

Bonomi, Louis E.: *See*—
Ramella, Joseph, 4,538,817, Cl. 273-380.000.

Boom, Johannes; Terlouw, Teunis; and Visser, Pieter, deceased (by Visser, Antonia Jacoba, nee Van der Heide, legal representative), to Shell Oil Company. Apparatus for separating solids of different shapes. 4,538,735, Cl. 209-691.000.

Boomer, Wayne. Mechanical bridge and chalk holder. 4,538,809, Cl. 273-18.000.

Booth, Martin: *See*—
Bleeker, Jan J.; Booth, Martin; van Grieken, Madeline G. F. M.; Krijnen, Wilhelmus J.; and van Wijngaarden, Gerhard D., 4,539,126, Cl. 252-39.000.

Borelli, Riccardo: *See*—
Bianchi, Gianfranco; Pierpaoli, Piero; Borelli, Riccardo; and Rainoldi, Luciano, 4,538,465, Cl. 73-722.000.

Borg-Warner Corporation: *See*—
Hansen, John C.; and Johnson, Lloyd A., 4,539,632, Cl. 364-143.000.
Wargin, Robert V., 4,539,240, Cl. 428-64.000.

Borm, Winfried: *See*—
Hahn, Helmuth; Cordt, Werner; and Borm, Winfried, 4,539,683, Cl. 371-15.000.

Bornstein, Jonathan G.; and Friedman, Peter S., to DHR, Incorporated. Lighting system combining daylight concentrators and an artificial source. 4,539,625, Cl. 362-32.000.

Borst, Paul H.: *See*—
Johnson, Bruce S.; and Borst, Paul H., 4,538,723, Cl. 206-3.000.

Borvendeg, Janos: *See*—
Orban, Erno ; Borvendeg, Janos; Nagy, Laszlo ; Sotinee Tolvay, Marta; and Bander, Erzsebet, 4,539,199, Cl. 424-22.000.

Bosch, Fridolin L.; and Swan, Clarence B., to AT&T Bell Laboratories. Laser driving means. 4,539,686, Cl. 372-26.000.

Bosits, Gyula: *See*—
Takacs, Istvan; Kerey, Gyorgy; Rudolf, Peter; Illes, Janos; Szabo, Bela; Vereczkey, Endre; Banos, Zoltan; Bosits, Gyula; and Czebe, Laszlo , 4,539,111, Cl. 210-179.000.

Boskamp, Jelles V., to Lever Brothers Company. Process for preparation of an anti-corrosive aqueous liquid detergent composition. 4,539,133, Cl. 252-109.000.

Bosna, Alexander A., to Westinghouse Electric Corp. Wire feed system for robot welder. 4,539,465, Cl. 219-137.700.

Boss, Heinz, to GRAPHA-Holding AG. Method and apparatus for storage of paper sheets and the like. 4,538,397, Cl. 53-430.000.

Bosse, Thomas W., to Pitney Bowes Inc. Temperature compensation system for a prism in an optical transducer. 4,539,475, Cl. 250-231.00P.

Boston, William G.; and Strong, Robert T., to Mobil Oil Corporation. Method and apparatus for separating artificial drill cuttings from natural drill cuttings. 4,539,102, Cl. 209-38.000.

Boswell, Peter G.: *See*—
Hall, William G.; and Boswell, Peter G., 4,538,876, Cl. 339-118.00R.

Bouchard, Andre, to GTE Products Corporation. Compact fluorescent lamp. 4,539,510, Cl. 313-493.000.

Boudault, Robert, to Telecommunications Radioelectriques et Telephoniques T.R.T. Bit synchronization arrangement for a data modem or data receiver. 4,539,693, Cl. 375-110.000.

Boudon, Gerard; Mollier, Pierre; and Lebesherais, Gerard, to International Business Machines Corp. Chip to chip information bit transmission process and device. 4,539,680, Cl. 370-100.000.

Boutonnat, Maurice; and Marget, Christian, to Charbonnages de France. Method and device for determining of explosivity rate of gaseous medium. 4,538,448, Cl. 73-27.00R.

Bowie, Richard T., Sr.: *See*—
Kleiner, Rudolph R.; Kleiner, Raymond W.; and Bowie, Richard T., Sr., 4,538,557, Cl. 123-78.00E.

Boyer, Robert E. Electrical generator with ring housing mountable on a wheel assembly. 4,539,497, Cl. 310-75.00R.

BP Chemicals Limited: *See*—
Green, Michael J., 4,539,427, Cl. 564-132.000.

Braatz, Andreas: *See*—
Kurz, Wolf-Dieter; Hanke, Hans; and Braatz, Andreas, 4,538,553, Cl. 123-41.130.

Bradford, Darlyne J. Lobe-pinching earring which simulates piercing earring. 4,538,429, Cl. 63-14.00G.

Bradley Corporation: *See*—
Barnum, Thomas G.; Smart, William A., Jr.; and Mullett, Donald H., 4,538,307, Cl. 4-427.000.

Bradt, Grodon E. Battery driven golf cart. 4,538,695, Cl. 180-19.200.

Brady, Joseph H.; Koenig, Albert A.; and Straub, Harry, to General Electric Co. Tubular assembly for transferring fluids. 4,538,834, Cl. 285-10.000.

Brady, Robert T.; and Gardell, Harry L., to Vapor Corporation. Refractory choke for a high intensity combustor. 4,538,551, Cl. 122-367.00R.

Brankiewicz, Alex J.; Bunge, Richard H.; French, James C.; Hokanson, Gerard C.; Hurley, Timothy R.; and Schaumberg, John P., to Warner-Lambert Company. CL-1577D And CL-1577E antibiotic/antitumor compounds, their production and use. 4,539,203, Cl. 424-117.000.

Brazell, James W., II: *See*—
Delahoussaye, Ronald D.; and Brazell, James W., II, 4,538,825, Cl. 280-242.0WC.

Brenman, Henry S.: *See*—
Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, 4,539,698, Cl. 381-70.000.
Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, 4,539,699, Cl. 381-70.000.

Bretagnolle, Bernard: *See*—
Jutier, Pierre; Bretagnolle, Bernard; and Rubat du Merac, Claire, 4,539,593, Cl. 358-160.000.

Brewer, John R.: *See*—
Armando, Toni E.; Brewer, John R.; Duvall, Leroy F.; and Novotny, John C., 4,539,211, Cl. 426-291.000.

Brewer, Richard D., to Micrometrics, Ltd. Microwave monitor. 4,539,567, Cl. 343-351.000.

Bridge Products, Inc.: *See*—
Earley, John R., 4,538,658, Cl. 152-427.000.

Bridges Electric, Inc.: *See*—
McBride, Joseph R., 4,539,520, Cl. 324-117.00H.

Brieger, Emmet F.; George, Flint R.; and Colle, Edward A., Jr., to Geo Vann, Inc. Gun below packer completion tool string. 4,538,680, Cl. 166-55.000.

Briska, Marian; and Bahr, Dietrich J., to International Business Machines Corporation. Method of making a metallic soap layer as a gliding layer on a metallized record carrier. 4,539,227, Cl. 427-179.000.

Brisson, Alfred G.: *See*—
Nowacki, Christopher; and Brisson, Alfred G., 4,538,620, Cl. 128-725.000.

Bristol, Alexander C. Aspheric spectacle lens blank. 4,538,887, Cl. 351-167.000.

Bristol-Myers Company: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,539,316, Cl. 514-212.000.

British Railways Board: *See*—
Birkin, Michael S., 4,538,781, Cl. 246-187.00B.

British Telecommunications: *See*—
Beales, Keith J.; Carter, Steve F.; Partington, Sally; and France, Paul W., 4,539,033, Cl. 65-134.000.

Brittain, David R.; Brown, David; and Wood, Robin, to Imperial Chemical Industries, plc. 7'-Trifluoromethyl-spiro[imidazolidine-4,3'-indoline]-2,2',5-triones as aldose reductase inhibitors. 4,539,329, Cl. 514-389.000.

Broaddus, Charles D.: *See*—
Thompson, James E.; and Broaddus, Charles D., 4,539,130, Cl. 252-94.000.

Brockington, F. Rhett; and Foster, William Z., to Anchor Continental. Reinforced filament tape. 4,539,248, Cl. 428-161.000.

Broekhuis, Antonius A., to Shell Oil Company. Process for the preparation of branched polymers. 4,539,136, Cl. 525-250.000.

Brogardh, Torgny; and Ovren, Christer, to Asea Aktiebolag. Optically excitable luminescent sensor elements. 4,539,473, Cl. 250-211.00R.

Broger, Emil A.; and Crameri, Yvo, to Hoffmann-La Roche Inc. Rhodium complexes of chiral phosphines. 4,539,411, Cl. 548-402.000.

Broken Hill Proprietary Company Limited, The: *See*—
Mainwaring, David E.; and Jones, Charles U., 4,539,010, Cl. 44-1.00C.

Brooksby, Brian T.: *See*—
Simpson, Anthony; Peterkin, Stuart M.; Brooksby, Brian T.; and Murray, Harold J., 4,538,991, Cl. 434-12.000.

Broome, Lloyd N.; and Lawrence, James, to Sanders Associates, Inc. Pen capping mechanism. 4,539,574, Cl. 346-139.00R.

Brophy, Arthur M. Baseball dispenser device for batting practice. 4,538,810, Cl. 273-26.00D.

Brors, Daniel L.: *See*—
Williams, Bob J.; and Brors, Daniel L., 4,539,278, Cl. 430-5.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Imaizumi, Mamoru; and Fujiwara, Takashi, 4,538,933, Cl. 400-582.000.

Brough, Denys W., to Rieter-Scragg Limited. Crossed belt false twist devices. 4,538,409, Cl. 57-336.000.

Brown, Alec T., to Mechanical Technology Incorporated. Multistage resonant compressor. 4,538,964, Cl. 417-267.000.

Brown, Boveri & Cie AG: *See*—
Harbach, Friedrich, 4,539,276, Cl. 429-191.000.

Brown, David: *See*—
Brittain, David R.; Brown, David; and Wood, Robin, 4,539,329, Cl. 514-389.000.

Brown, Ian G., to Xerox Corporation. Copiers for simplex and duplex copying. 4,538,906, Cl. 355-14.0SH.

Brown, Neil L., to Neil Brown Instrument Systems, Inc. Band-pass amplifier filters. 4,539,525, Cl. 330-107.000.

Brown, Paul S.: *See*—
Martin, Larry D.; and Brown, Paul S., 4,539,134, Cl. 252-156.000.

Brown, Thomas H.; and Ife, Robert J., to Smith Kline & French Laboratories Limited. Pyrimidine compounds. 4,539,207, Cl. 514-272.000.

Brubaker, Weldon L.; and Case, Arnold A., to Molex Incorporated. Electrical contact for terminating insulated conductors. 4,538,872, Cl. 339-97.00P.

Bruce, Daniel E.; and Esola, John L., to Rockwell International Corporation. Temperature compensated gas meters. 4,538,458, Cl. 73-233.000.

Bruckner Trockentechnik GmbH & Co. KG: *See*—
Gresens, Harry, 4,538,361, Cl. 34-82.000.

Brugger, Manfred; and Vogt, Peter, to BBC Brown, Boveri & Company, Limited. Device and process for making thin-walled wax models for lost-wax casting. 4,539,168, Cl. 264-102.000.

Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., to General Electric Company. Microcomposite of metal carbide and ceramic particles. 4,539,141, Cl. 252-516.000.

Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., to General Electric Company. Microcomposite of metal boride and ceramic particles. 4,539,299, Cl. 501-96.000.

Brunner, Engelbert, to J. S. Staedtler KG. Automatic lead advancing mechanism for a mechanical pencil. 4,538,934, Cl. 401-53.000.

Brunninger, Manfred: *See*—
Theurer, Josef; and Brunninger, Manfred, 4,538,687, Cl. 171-16.000.

Brunswick Corporation: *See*—
Draxler, James R.; and Snyder, Richard H., 4,539,452, Cl. 200-334.000.

Buck, Rainer; Engel, Gerhard; Kuttner, Thomas; Sautter, Wilfried; and Wessel, Wolf, to Robert Bosch GmbH. Regulating arrangement for fuel adjusting means for a self-igniting internal combustion engine. 4,538,571, Cl. 123-357.000.

Budd Company, The: *See*—
Eggert, Walter S., Jr., 4,538,524, Cl. 105-182.00R.

Buess, Gerhard: *See*—
Boebel, Manfred; Baier, Manfred; and Buess, Gerhard, 4,538,594, Cl. 128-6.000.

Buhl, Reinhard: *See*—
Burmeister, Joachim; Buhl, Reinhard; and Westphal, Paul, 4,538,935, Cl. 403-140.000.

Bundschuh, Robert L.: *See*—
Dunning, Walter B.; and Bundschuh, Robert L., 4,538,745, Cl. 222-153.000.

Bunge, Richard H.: *See*—
Brankiewicz, Alex J.; Bunge, Richard H.; French, James C.; Hokanson, Gerard C.; Hurley, Timothy R.; and Schaumberg, John P., 4,539,203, Cl. 424-117.000.

Bunnel Life Systems, Inc.: *See*—
Usry, Joe D.; Bunnell, James B.; and Faddis, Chris G., 4,538,604, Cl. 128-204.230.

Bunnell, James B.: *See*—
Usry, Joe D.; Bunnell, James B.; and Faddis, Chris G., 4,538,604, Cl. 128-204.230.

Burckhardt, Klaus A.; and Blessing, Jules C., to Messer Griesheim Industries, Inc. Method and apparatus for improving oxygen burner performance in a glass furnace. 4,539,035, Cl. 65-136.000.

Burger, Kurt; and Friedrich, Heinz, to Robert Bosch GmbH. Method of manufacturing corrosion-resistant measuring probes. 4,539,059, Cl. 156-251.000.

Burger, Peter: *See*—
Lobo, Claude; and Burger, Peter, 4,538,852, Cl. 296-91.000.

Burgess, Allan C.; Magee, Robert A.; and Melvin, George E., to International Business Machines Corporation. Forming multilayer ceramic substrates from large area green sheets. 4,539,058, Cl. 156-250.000.

Burgi, Hanspeter: *See*—
Honegger, Werner; and Burgi, Hanspeter, 4,539,470, Cl. 235-98.00B.

Burkhardt, Werner: *See*—
Arntz, Dietrich; Prescher, Gunter; Burkhardt, Werner; Heilos, Johannes; and Manner, Reinhard, 4,539,409, Cl. 546-286.000.

Burkholder, Jack. Set screw. 4,538,947, Cl. 411-393.000.

Burmeister, Joachim; Buhl, Reinhard; and Westphal, Paul, to Lemforder Metallwaren AG. Ball and socket joint, particularly for heavily loaded joint linkages in motor vehicles. 4,538,935, Cl. 403-140.000.

Burroughs Corporation: *See*—
Flora, Laurence P., 4,539,517, Cl. 324-73.00R.

Burroughs Wellcome Co.: *See*—
Moncada, Salvador, 4,539,333, Cl. 514-469.000.

Burzynski, Alfred J.; and Stengle, Edward J., to Owens-Illinois, Inc. Solventless liquid organopolysiloxanes. 4,539,232, Cl. 427-387.000.

Buss, Waldeen C.: *See*—
Wilson, Charles R.; Buss, Waldeen C.; and Field, Leslie A., 4,539,305, Cl. 502-66.000.

Bussink, Jan: *See*—
Abeelen, Petrus C. A. M. V.; Bussink, Jan; and Heuschen, Jean M. H., 4,539,350, Cl. 523-527.000.

Butcher, Anthony V.; and Hatt, Brian W., to Elkem a/s. Lubricating system composition for extrusion of polyvinyl chloride resin binder. 4,539,124, Cl. 252-28.000.

Bux, Werner K.; Dixon, Roy C.; and Rothauser, Ernst H., to International Business Machines Corp. Synchronization in a communication network of interconnected rings. 4,539,679, Cl. 370-88.000.

Buzby, George C., Jr., to American Home Products Corporation. Anti-arrhythmic agents. 4,539,426, Cl. 564-92.000.

C. Conradty Nurnberg GmbH & Co KG: *See*—
Schieber, Franz, 4,539,229, Cl. 427-215.000.

C-H Development and Sales, Inc.: *See*—
Hollingsworth, Clinton A., 4,539,103, Cl. 209-158.000.

Cabbiness, Dale K.: *See*—
Krottinger, David L.; and Cabbiness, Dale K., 4,539,645, Cl. 364-478.000.

Caldero Ges, Jose M.; and Duena, Antonio P., to Laboratorios Vita, S.A. Imidazole carboxamide derivatives and pharmaceutical compositions thereof. 4,539,331, Cl. 514-400.000.

California Institute of Technology: *See*—
Rowlette, John J., 4,539,268, Cl. 429-54.000.

Camco, Incorporated: *See*—
Johnston, Russell A., 4,538,681, Cl. 166-125.000.
Pringle, Ronald E.; and Black, Paul W., 4,538,685, Cl. 166-321.000.
Pringle, Ronald E., 4,538,838, Cl. 285-91.000.

Camlibel, Irfan; Chin, Aland K.; Chin, Brymer H.; and Zipfel, Christie L., to AT&T Bell Laboratories. Forming platinum contacts to in-based group III-V compound devices. 4,538,342, Cl. 29-569.00L.

Campbell, Henry F., to William H. Rorer, Inc. 5-Diaza-aryl-3-substituted pyridone compounds. 4,539,321, Cl. 514-252.000.

Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., to Pfizer Inc. Dihydropyridine derivatives and their use in treating heart conditions and hypertension. 4,539,322, Cl. 514-253.000.

Campbell Soup Company: *See*—
Hudson, James A., 4,538,694, Cl. 177-145.000.
Wilkerson, C. William, 4,538,806, Cl. 272-122.000.

Canamero, Ernest V.: *See*—
Cherkasky, Miles R.; and Canamero, Ernest V., 4,539,213, Cl. 426-512.000.

Cann, Everett D. Process for the treatment of waste and contaminated waters with improved recovery of aluminum and iron flocculating agents. 4,539,119, Cl. 210-711.000.

Canon Kabushiki Kaisha: *See*—
Inuzuka, Tsuneki; Kawatsura, Yoshihiro; and Ishida, Masato, 4,538,902, Cl. 355-14.0FU.
Kinoshita, Takao; Tsunekawa, Tokuichi; and Sato, Yuichi, 4,539,597, Cl. 358-213.000.
Komine, Yoshio, 4,539,601, Cl. 358-335.000.
Masaki, Tatsuo, 4,538,884, Cl. 350-361.000.
Matsuyama, Shinichi; and Shimizu, Masami, 4,538,891, Cl. 354-289.100.
Nakata, Shinichi, 4,538,924, Cl. 368-74.000.
Nose, Noriyuki, 4,539,482, Cl. 250-578.000.
Sakai, Shinji; Harada, Yoshihito; Ishizaki, Akira; and Kawabata, Takashi, 4,538,892, Cl. 354-402.000.
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,539,283, Cl. 430-61.000.
Tajima, Hatsuo; Takahashi, Tohru; and Hosono, Nagao, 4,538,896, Cl. 355-3.00R.
Watanabe, Takashi; Ozawa, Masakazu; Koizumi, Yutaka; and Matsumoto, Haruyuki, 4,539,569, Cl. 346-140.00R.
Yomoda, Minoru; and Tsukamoto, Izumi, 4,538,914, Cl. 356-400.000.

Cantec, Incorporated: *See*—
Frei, Siegfried, 4,538,439, Cl. 72-105.000.

Cantor, Frank J.; and Horwitz, Robert P., to International Telephone & Telegraph Corp. Clean-in-place pump. 4,538,959, Cl. 415-98.000.

Carbonel, Claude. Stabilizing apparatus for a craft. 4,538,538, Cl. 114-125.000.

Carl-Zeiss-Stiftung: *See*—
Heynacher, Erich; and Ludewig, Reinhard, 4,538,911, Cl. 356-358.000.

Carle & Montanari S.p.A.: *See*—
Cerboni, Renzo, 4,538,978, Cl. 425-206.000.

Carlqvist, Bengt R.; and Svensson, Lars T. E., to Telefonaktiebolaget LM Ericsson. Method of providing adaptive echo cancellation in transmission of digital information in duplex, and apparatus for performing the method. 4,539,674, Cl. 370-32.000.

Carlson, John D.; Kifer, Edward W.; Wojtyna, Vincent J.; and Colton, James P., to Koppers Company, Inc. Phenol formaldehyde resoles for making phenolic foam. 4,539,338, Cl. 521-131.000.

Carlson, Ronald F.: *See*—
Clifton, James E.; and Carlson, Ronald F., 4,538,943, Cl. 408-14.000.

Carminati, Julien, to Centre de Production Mecanique. Method for threading spokes on a spoke wheel hub. 4,538,332, Cl. 29-159.020.

Carobbi, Renato: *See*—
Filippini, Andrea; and Carobbi, Renato, 4,539,147, Cl. 260-112.50R.

Carrier Corporation: *See*—
Lord, Richard G., 4,538,419, Cl. 62-129.000.

Mount, Gordon L.; and Lavigne, William J., Jr., 4,538,422, Cl. 62-201.000.

Carris, Bonni S.: *See—*
Johannsen, Donald R., 4,538,382, Cl. 51-69.000.

Carter, Lee T. Collapsible electric golf cart. 4,538,696, Cl. 180-19.300.

Carter, Steve F.: *See—*
Beales, Keith J.; Carter, Steve F.; Partington, Sally; and France, Paul W., 4,539,033, Cl. 65-134.000.

Cascone, Paul J., to Pennwalt Corporation. Low gold dental alloys. 4,539,176, Cl. 420-463.000.

Case, Arnold A.: *See—*
Brubaker, Weldon L.; and Case, Arnold A., 4,538,872, Cl. 339-97.00P.

Cashmere, Raymond. HUll construction. 4,538,540, Cl. 114-288.000.

Casio Computer Co., Ltd.: *See—*
Hanzawa, Koutarou, 4,538,496, Cl. 84-1.260.
Sato, Kunio, 4,538,495, Cl. 84-1.190.

Casler, William A.: *See—*
Saurenman, Phillip E.; and Casler, William A., 4,538,647, Cl. 138-166.000.

Cates, Charles E.: *See—*
Schwartz, Arthur G., 4,539,106, Cl. 210-88.000.

Cavalli, Alfredo. Apparatus for making ice cream and similar cold products and having a removable freezer vessel. 4,538,427, Cl. 62-342.000.

Celanese Corporation: *See—*
Becker, Carol L., 4,538,490, Cl. 83-346.000.
DeGooyer, William J., 4,539,347, Cl. 523-404.000.
Gajria, Chandrasen; and Ozari, Yehuda, 4,539,348, Cl. 523-409.000.
Yoon, Hyun-Nam, 4,539,386, Cl. 528-183.000.

Celotex Corporation: *See—*
Franz, Edward W., 4,539,252, Cl. 428-218.000.

Centennial Machine Company, Inc.: *See—*
Harben, Grover S., Jr.; Ellis, James S.; and Emmett, Joe M., 4,538,325, Cl. 17-45.000.

Centre de Production Mecanique: *See—*
Carminati, Julien, 4,538,332, Cl. 29-159.020.

Centre National de la Recherche Scientifique (CNRS): *See—*
Bertrand, Claude, 4,538,979, Cl. 431-12.000.

Cerboni, Renzo, to Carle & Montanari S.p.A. Rotary piston forming machine for chocolate. 4,538,978, Cl. 425-206.000.

Cettl, Jindrich, to Bayerische Motoren Werke AG. Apparatus for assembling two telescoping parts, of which at least one has a radially directed projection. 4,538,333, Cl. 29-240.000.

Chaki, Takao: *See—*
Kanai, Takao; and Chaki, Takao, 4,538,473, Cl. 74-10.330.

Chalupka, Georg: *See—*
Muschelknautz, Edgar; Rink, Norbert; and Chalupka, Georg, 4,539,029, Cl. 65-5.000.

Chamberlain Manufacturing Corporation: *See—*
Henry, Susanne G.; Tsunemura, Kazuo; and Iha, Kiyoshi, 4,538,661, Cl. 160-35.000.

Champion International Corporation: *See—*
Dutcher, Daniel P., 4,538,759, Cl. 229-52.00B.

Chan, W. Geoffrey; and Houminer, Yoram, to Philip Morris Incorporated. Smoking compositions containing a β-hydroxy-γ-ketoester flavorant-release additive. 4,538,627, Cl. 131-276.000.

Chance, Dudley A.; and Sampogna, Michael, to International Business Machines Corporation. Electrolytic printing head. 4,539,576, Cl. 346-165.000.

Chance, James L.; and Wedel, Gregory L., to Beloit Corporation. Steam heated dryer drum having stationary siphon and spoiler bars. 4,538,360, Cl. 34-41.000.

Chandler, Earl E. Apparatus for supportingly organizing miscellaneous articles. 4,538,862, Cl. 312-283.000.

Chandrasekaran, Swayambu: *See—*
Chung, Daniel C.; and Chandrasekaran, Swayambu, 4,539,354, Cl. 524-128.000.

Chaney, David B.: *See—*
Williams, Marvin E.; Chaney, David B.; and Rebele, Donald J., 4,538,709, Cl. 190-18.00A.

Chang, Biau-Hung, to Ashland Oil, Inc. Use of mixed metal catalysts in the hydroformylation of olefins to produce linear aldehydes and alcohols. 4,539,306, Cl. 502-154.000.

Charbonnages de France: *See—*
Boutonnat, Maurice; and Marget, Christian, 4,538,448, Cl. 73-27.00R.

Charles, Joseph P.: *See—*
Khachaturian, Jon E.; and Charles, Joseph P., 4,538,849, Cl. 294-81.100.

Chase, Cleve D. Mobile boat dolly. 4,538,952, Cl. 414-458.000.

Chatterjea, Probir K., to Dresser Industries, Inc. Clutch-clutch-brake steering mechanism for tractors. 4,538,641, Cl. 137-596.100.

Chen, Kwang-Ming: *See—*
Cheng, Cheng-Yi; Lee, Shou-Yuan; Chen, Kwang-Ming; and Hong, Won-Doon, 4,539,380, Cl. 526-78.000.

Chen, Richard M.: *See—*
Spackova, Daniela S.; and Chen, Richard M., 4,539,585, Cl. 358-93.000.

Cheng, Cheng-Yi; Lee, Shou-Yuan; Chen, Kwang-Ming; and Hong, Won-Doon, to Formosa Plastics Corporation. Process for producing homopolymers or copolymers of olefinically unsaturated monomers. 4,539,380, Cl. 526-78.000.

Cherbuy, Bernard: *See—*
Binder, Jean-Jacques; and Cherbuy, Bernard, 4,538,321, Cl. 15-306.00R.

Cherkasky, Miles R.; and Canamero, Ernest V., to Cherkasky, Miles R. Method for making deep dish pizza crusts or the like. 4,539,213, Cl. 426-512.000.

Cheung, Nai-Kong V : *See—*
Reid, Michael J.; Kwasnicki, J. Michael; and Cheung, Nai-Kong V., 4,539,292, Cl. 435-7.000.

Chevrier, Jean: *See—*
Trong, Linh N.; and Chevrier, Jean, 4,539,501, Cl. 310-313.00A.

Chevron Research Company: *See—*
Field, Leslie A., 4,539,304, Cl. 502-66.000.
Starkston, Robert; Luce, Mark C.; and Homsy, Robert V., 4,539,189, Cl. 423-220.000.
Wilson, Charles R.; Buss, Waldeen C.; and Field, Leslie A., 4,539,305, Cl. 502-66.000.

Chiang, Chin-Chih: *See—*
King, Ming L.; Chiang, Chin-Chih; Ling, Han-Chin; Ochiai, Masahito; Fujita, Eiichi; and McPhail, Andrew T., 4,539,414, Cl. 549-458.000.

Chicago Metallic Corporation: *See—*
Skrabis, Thomas S.; and Jahn, Martin D., 4,538,391, Cl. 52-478.000.

Chin, Aland K.: *See—*
Camlibel, Irfan; Chin, Aland K.; Chin, Brymer H.; and Zipfel, Christie L., 4,538,342, Cl. 29-569.00L.

Chin, Brymer H.: *See—*
Camlibel, Irfan; Chin, Aland K.; Chin, Brymer H.; and Zipfel, Christie L., 4,538,342, Cl. 29-569.00L.

Chiu, Jessie T.: *See—*
Van Ornum, Joel V.; and Chiu, Jessie T., 4,539,344, Cl. 523-166.000.

Chiu, Ran F.; Kromer, Philip F., III; Kao, Ming L.; and Parrish, Henry H., to Racal Data Communications, Inc. Fast learn digital adaptive equalizer. 4,539,689, Cl. 375-13.000.

Chiyoda Chemical Enginrng & Constrct. Co. Ltd.: *See—*
Ohzeki, Osamu; Shimakawa, Katsuhiko; and Mashino, Zenichi, 4,539,012, Cl. 44-51.000.

Chloe Chimie: *See—*
Bachot, Jean; and Grosbois, Jean, 4,539,085, Cl. 204-98.000.

Chretien, Michele. Temperature indicating device. 4,538,926, Cl. 374-150.000.

Chujo, Yoshiki; and Noguchi, Hiroshi, to Toyota Jidosha Kabushiki Kaish.a. Device for controllably heating oxygen sensor. 4,538,575, Cl. 123-440.000.

Chulick, Eugene T., to Babcock & Wilcox Company, The. Multiple point groundwater sampler. 4,538,683, Cl. 166-264.000.

Chung, Daniel C.; and Chandrasekaran, Swayambu, to Allied Corporation. Stabilized ethylene/chlorotrifluoroethylene copolymer composition. 4,539,354, Cl. 524-128.000.

Chung, James Y. J.; Jones, Jesse D.; and Li, Hsueh M., to Ethyl Corporation. Injection-moldable thermoplastic polyester composition. 4,539,352, Cl. 524-109.000.

Chute, Richard: *See—*
Schutten, Herman P.; Hoppie, Lyle O.; Turner, David; and Chute, Richard, 4,538,642, Cl. 137-625.280.

Chylinski, Victoria S.: *See—*
Trager, Seymour F.; and Chylinski, Victoria S., 4,539,330, Cl. 514-398.000.

Ciba-Geigy Corporation: *See—*
Abel, Heinz; and Guth, Christian, 4,539,353, Cl. 524-123.000.
Guglielmetti, Leonardo, 4,539,161, Cl. 260-465.00E.
Kristiansen, Odd; Drabek, Jozef; and Fluck, Victor, 4,539,314, Cl. 514-84.000.
Renfroe, Harris B., 4,539,410, Cl. 548-336.000.
Spivack, John D.; Pastor, Stephen D.; and Odorisio, Paul, 4,539,421, Cl. 560-105.000.

Cibertec S.A.: *See—*
Artinano, Antonio T.; Jimenez, Hernan N.; Thalman, Bernal C.; and Vasquez, Marco A. E., 4,539,480, Cl. 250-551.000.

Ciliberti, David F.; and Lippert, Thomas E., to Westinghouse Electric Corp. Filtering system. 4,539,025, Cl. 55-302.000.

Cillario, Lorenzo, to Ferrero S.p.A. Container for small objects, particularly pastilles and similar confectionery products. 4,538,731, Cl. 206-540.000.

Clarion Co., Ltd.: *See—*
Hayashi, Hideki; Takagi, Satoshi; Ito, Yukio; and Endo, Sadayoshi, 4,538,753, Cl. 226-199.000.
Kanai, Takao; and Chaki, Takao, 4,538,473, Cl. 74-10.330.
Takai, Kazuki, 4,539,610, Cl. 360-93.000.

Clark, Bruce D., to G. W. Lisk Company, Inc. Solenoid construction and method for making the same. 4,539,542, Cl. 335-261.000.

Clark, Malcolm W.; and Kohn, Harold B., to Lummus Company, The. Distribution grid support structure. 4,539,183, Cl. 422-143.000.

Clark, Richard E.: *See—*
Piccioli, David P.; Harry, Ieuan L.; and Clark, Richard E., 4,539,463, Cl. 219-121.0LG.

Clarke, Brian P.; Harbridge, John B.; and Stirling, Irene, to Beecham Group p.l.c. Derivatives of clavulanic acid, a process for their preparation and their use. 4,539,202, Cl. 424-114.000.

Clarke, Patrick E.; and Wilcox, Gary, to University of California, The Regents of the. Ultraviolet imaging method and apparatus. 4,539,297, Cl. 436-164.000.

Clayton, William J., to Mobil Oil Corporation. Fastening apparatus for twist ties. 4,539,237, Cl. 428-40.000.

CLEARING, a division of U.S. Industries, Inc.: *See—*
Lerch, Orville L., 4,538,797, Cl. 269-27.000.

Clearman, Melvin R.; and Springen, Clyde H., to Texas Instruments Incorporated. Video data acquisition system and hand-held application module for operation thereof. 4,539,703, Cl. 382-28.000.

Cleaver, Gordon E.: *See*—
McAloon, Kevin T.; Heeson, Iona E.; and Cleaver, Gordon E., 4,539,046, Cl. 106-121.000.

Cleland, Robert K. Liquid aspirator with improved anti-syphon tube. 4,538,636, Cl. 137-216.000.

Clifford, Richard P.; and Birchall, Gerrard A., to Dearborn Chemicals Limited. Biocide. 4,539,071, Cl. 162-161.000.

Clifton, James E.; and Carlson, Ronald F., to General Dynamics Corporation/Convair Div. Adjustable nosepiece for a drill motor. 4,538,943, Cl. 408-14.000.

Clorox Company, The: *See*—
Alvarez, Vincent E.; and Conkey, David L., 4,539,145, Cl. 252-542.000.
Dunning, Walter B.; and Bundschuh, Robert L., 4,538,745, Cl. 222-153.000.

Club Car, Inc.: *See*—
Ferrell, James C., 4,539,162, Cl. 261-1.000.

Cobb, Albert R., III: *See*—
Raab, Andrew F.; and Cobb, Albert R., III, 4,539,446, Cl. 200-16.00R.

Coblenz, William S., to United States of America, Navy. Method for the fabrication of hexagonal BN toughened matrix composites. 4,539,300, Cl. 501-98.000.

Cohee, Arthur H.: *See*—
Schweid, Jeffrey M.; Cohee, Arthur H.; and Dec, Anthony F., 4,539,215, Cl. 426-589.000.

Cohen, Lawrence B., to Jos. Cavedon Company Inc. Aluminum zirconium metallo-organic complexes useful as coupling agents. 4,539,048, Cl. 106-287.170.

Cohen, Lawrence B., to Jos. Cavedon Co., Inc. Aluminum zirconium metallo-organic complex useful as coupling and hydrophobic agents. 4,539,049, Cl. 106-287.170.

Coker, Clyde R. Anhydrous ammonia fertilizer applicator. 4,538,532, Cl. 111-7.000.

Colasante, David A. Prophylaxis of adhesions with low frequency sound. 4,538,596, Cl. 128-32.000.

Colato, Albert E.; and Pomroy, James F., to Plastics, Inc. Adjustable shelf for microwave ovens. 4,539,455, Cl. 219-10.55E.

Cole, Charles F.: *See*—
Overton, Raymond C.; and Cole, Charles F., 4,538,672, Cl. 165-27.000.

Colgate Palmolive Co.: *See*—
Ramachandran, Pallassana; and Grand, Paul S., 4,539,135, Cl. 252-174.110.

Colle, Edward A., Jr.: *See*—
Brieger, Emmet F.; George, Flint R.; and Colle, Edward A., Jr., 4,538,680, Cl. 166-55.000.

Collette, Douglas P.: *See*—
Jacobs, Paul H.; and Collette, Douglas P., 4,539,707, Cl. 455-47.000.

Colliander, Alan C., to Profile Extrusions Company. Low friction weather seal. 4,538,380, Cl. 49-475.000.

Collins, Albert V.; and Asmus, Richard W., to Mooney Chemicals, Inc. Method for treating wood. 4,539,235, Cl. 427-440.000.

Colton, James P.: *See*—
Carlson, John D.; Kifer, Edward W.; Wojtyna, Vincent J.; and Colton, James P., 4,539,338, Cl. 521-131.000.

Columbia Gas System Service Corporation: *See*—
Schettler, Paul D., Jr., 4,538,460, Cl. 73-432.00R.

Colvert, James H.: *See*—
MacLean, John P.; Bittensky, Joel S.; and Colvert, James H., 4,539,303, Cl. 502-39.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Saito, Hideo; Kato, Hitoshi; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 4,538,830, Cl. 280-647.000.

Combustion Engineering, Inc.: *See*—
Palmer, David N.; and Ferrell, Gary W., 4,539,052, Cl. 148-6.240.
Paskowski, Frank J., Jr.; and Stanwicks, Peter L., 4,538,765, Cl. 241-101.200.
Roberts, Wayne L., 4,539,164, Cl. 261-114.00A.
Rosso, John B., 4,539,523, Cl. 328-141.000.
Sindel, Allen W., 4,539,464, Cl. 219-137.00R.
Smuda, Robert T., 4,538,552, Cl. 122-387.000.

Commissariat a l'Energie Atomique: *See*—
Le Coq, Gerard; and Soussaline, Francoise, 4,539,639, Cl. 364-414.000.
Potard, Claude; and Dusserre, Pierre, 4,539,173, Cl. 264-570.000.

Commonwealth of Australia, The: *See*—
Galbreath, Ronald E.; and Harrison, Bruce R., 4,539,701, Cl. 382-1.000.

Compagnie Francaise d'Etudes et de Construction "Technip" : *See*—
Paradowski, Henri; and Leroux, Didier, 4,539,028, Cl. 62-9.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See*—
Binder, Jean-Jacques; and Cherbuy, Bernard, 4,538,321, Cl. 15-306.00R.

Conkey, David L.: *See*—
Alvarez, Vincent E.; and Conkey, David L., 4,539,145, Cl. 252-542.000.

Conner, William A., to Rockwell International Corporation. Measurement of oscillator spillover noise in a single sideband system. 4,539,709, Cl. 455-67.000.

Connors, Robert H.: *See*—
Klopfenstein, King L.; Connors, Robert H.; and Bergholt, Steven P., 4,538,693, Cl. 177-25.000.

Conoco Inc.: *See*—
Duckwall, Louis R., Jr., 4,539,369, Cl. 525-61.000.
Krottinger, David L.; and Cabbiness, Dale K., 4,539,645, Cl. 364-478.000.
Overton, Raymond C.; and Cole, Charles F., 4,538,672, Cl. 165-27.000.

Constructie Werkhuizen Vandekerckhove N.V.: *See*—
Vandenbussche, Joseph, 4,538,766, Cl. 241-30.000.

Continental Can Company, Inc.: *See*—
Mohr, Glenn R., 4,539,456, Cl. 219-10.690.

Continental Packaging Company, Inc.: *See*—
Piccioli, David P.; Harry, Ieuan L.; and Clark, Richard E., 4,539,463, Cl. 219-121.0LG.

Continental-Wirt Electronics Corp.: *See*—
Worth, Sidney V., 4,538,873, Cl. 339-99.00R.

Control Concepts Corporation: *See*—
Delaney, Sean; and Montague, Herbert R., 4,539,617, Cl. 361-58.000.

Cook, Dudley D., Jr.: *See*—
Graham, Marshall D.; Cook, Dudley D., Jr.; Gecks, Donald L.; and Shaw, Robert, 4,538,885, Cl. 350-529.000.

Cooney, Edward F.: *See*—
Wagner, Paul D.; and Cooney, Edward F., 4,538,819, Cl. 277-4.000.

Cooper, Ian G.: *See*—
O'Connor, Terry J.; and Cooper, Ian G., 4,539,254, Cl. 428-236.000.

Corain, Luciano, to Nuovo Pignone S.p.A. Heald control system for a travelling wave shedding loom. 4,538,648, Cl. 139-79.000.

Cordingley, David C.: *See*—
Andruchiw, Roman; Cordingley, David C.; and Loughborough, Mark T., 4,539,064, Cl. 156-379.700.

Cordis Corporation: *See*—
Tarjan, Peter P., 4,538,624, Cl. 128-784.000.

Cordt, Werner: *See*—
Hahn, Helmuth; Cordt, Werner; and Borm, Winfried, 4,539,683, Cl. 371-15.000.

Costruzioni Aeronautiche Giovanni Agusta S.p.A.: *See*—
Pariani, Emilio, 4,538,961, Cl. 416-114.000.

Coulter Electronics, Inc.: *See*—
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Coupling Systems, Inc.: *See*—
Royston, James M., 4,538,841, Cl. 285-337.000.

Cousse, Henri: *See*—
Mouzin, Gilbert; Cousse, Henri; and Vilain, Pol, 4,539,413, Cl. 549-366.000.

Cowart, Ronald W.: *See*—
Zermeno, Alfonso; Marsh, Lee M., Jr.; and Cowart, Ronald W., 4,539,591, Cl. 358-335.000.

Cowles, Richard A., to Inmont Corporation. Metal fixative in automative paint. 4,539,360, Cl. 524-441.000.

Cozens, Ross J., to Imperial Chemical Industries PLC. Chelate-activated vinyl chloride polymerization process. 4,539,381, Cl. 526-93.000.

Crabtree, Grace Y., to Union Carbide Corporation. Galvanic cell having a coiled electrode assembly. 4,539,271, Cl. 429-94.000.

Craft, George E.: *See*—
Graves, Delbert E.; and Craft, George E., 4,539,239, Cl. 428-43.000.

Crameri, Yvo: *See*—
Broger, Emil A.; and Crameri, Yvo, 4,539,411, Cl. 548-402.000.

Crane Carrier Company: *See*—
Yeazel, Kenneth L.; and Forester, Robert J., 4,538,951, Cl. 414-407.000.

Crenshaw, Ronnie R.: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,539,316, Cl. 514-212.000.

Crevling, Robert L., Jr.: *See*—
Miller, Jonathan; Wacek, Rudolph W.; Berfield, Robert C.; Meland, Ronald F.; Crevling, Robert L., Jr.; and Lawson, Lonnie B., Jr., 4,538,971, Cl. 417-423.00A.

Crider, Quincy E., to Sigma Chemical Company. Rapid, accurate method of separation of oxalate from urine and other biological fluids. 4,539,118, Cl. 210-683.000.

Crites, Allan B., to Arlasky, David F. Vehicle alarm apparatus. 4,539,548, Cl. 340-63.000.

Crockatt, William B.; and Rimma, John, to DeSoto, Inc. Clear coatings to protect wood from discoloring and greying on exterior exposure. 4,539,047, Cl. 106-268.000.

Cronk, Allan D. Anti-corrosion pipe apparatus. 4,538,837, Cl. 285-55.000.

Cross, Peter E.: *See*—
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,539,322, Cl. 514-253.000.

Crossley, Roger, to John Wyeth & Brother Limited. Preparation of fused carbocyclic ring derivatives of pyridine. 4,539,406, Cl. 546-14.000.

Crowell Corporation, The: *See*—
Adelman, Robert W.; and Blevins, Daniel W., 4,538,659, Cl. 157-1.000.

Crown Zellerbach Corporation: *See*—
Zuscik, Edward J., 4,539,259, Cl. 428-332.000.

Cruise, Thomas W.; and Milbrandt, Thomas N., to Magnetic Controls Company. Terminal block. 4,538,868, Cl. 339-34.000.

Cue, Robert; and Hagemann, Alfred, to Akerlund & Rausing Verpackung GmbH. Apparatus for the transfer of print designs. 4,539,063, Cl. 156-361.000.

Cunningham, William J. Trifunctional golfing cage. 4,538,814, Cl. 273-176.00F.

Currier, David W., to Motorola, Inc. Integrated circuit carrier and assembly. 4,539,621, Cl. 361-386.000.

Curzio, Frederick H., to Textile Products, Incorporated. Method and apparatus for producing blends of resinous, thermoplastic fiber, and laminated structures produced therefrom. 4,539,249, Cl. 428-175.000.

Cuscurida, Michael; Yeakey, Ernest L.; and Peterson, Bruce W., to Texaco Inc. Polyurethane foams made from vinyl polymer polyols. 4,539,339, Cl. 521-137.000.

Cuscurida, Michael; and Yeakey, Ernest L., to Texaco Inc. Vinyl polymer polyols made using epoxy resin-modified polyols. 4,539,378, Cl. 525-407.000.

Cutler, Duncan B.: *See*—
Henry, Nelson R.; Cutler, Duncan B.; and Warner, William L., 4,538,692, Cl. 177-1.000.

Czebe, Laszlo : *See*—
Takacs, Istvan; Kerey, Gyorgy; Rudolf, Peter; Illes, Janos; Szabo, Bela; Vereczkey, Endre; Banos, Zoltan; Bosits, Gyula; and Czebe, Laszlo , 4,539,111, Cl. 210-179.000.

D B Industries, Inc.: *See*—
Wolner, J. Thomas, 4,538,702, Cl. 182-3.000.

Dahlgren, Harold P. Ink metering apparatus. 4,538,518, Cl. 101-350.000.

Daicel Chemical Industries, Ltd.: *See*—
Fukuda, Yutaka; and Sasaki, Kenichi, 4,539,394, Cl. 528-354.000.
Okabayashi, Norio, 4,539,079, Cl. 204-5.000.

Daiichi Seiyaku Co., Ltd.: *See*—
Hayakawa, Isao; and Tanaka, Yoshiaki, 4,539,401, Cl. 544-101.000.

Daikin Kogyo Co. Ltd.: *See*—
Fujii, Tsuneo; Inukai, Hiroshi; Deguchi, Takayuki; Amano, Toshihiko; Kakuchi, Masami; Asakawa, Hiroshi; and Kogure, Osamu, 4,539,250, Cl. 428-195.000.

Daimler-Benz Aktiengesellschaft: *See*—
Kurz, Wolf-Dieter; Hanke, Hans; and Braatz, Andreas, 4,538,553, Cl. 123-41.130.

Dainippon Screen Mfg. Co., Ltd: *See*—
Sano, Tetsuo, 4,539,478, Cl. 250-235.000.

Dambach, Philip J.; and Berg, B. Alan, to Molex Incorporated. Modular jack assembly. 4,538,874, Cl. 339-99.00R.

Dambach, Philip J.; and Berg, B. Alan, to Molex Incorporated. Solderless circuit board connector. 4,538,878, Cl. 339-217.00R.

Damm, Norbert: *See*—
Kobel, Alfons; and Damm, Norbert, 4,538,664, Cl. 164-37.000.

Damsgaard, Raymond, to A/S Chr. Fabers Fabriker. Mounting for the setting up of blinds. 4,538,785, Cl. 248-268.000.

Danfoss A/S: *See*—
Blohm, Knud; and Krogh, Egon, 4,538,717, Cl. 192-0.094.

Danna, Dominick; Wheeler, Robert C.; and English, Stanley R., to Welch Allyn Inc. Connector module for video endoscopic system. 4,539,586, Cl. 358-98.000.

Dantlgraber, Jorg; and Morio, Klaus, to Mannesmann Rexroth GmbH. Hydrostatic radial piston pump. 4,538,965, Cl. 417-273.000.

Davco Manufacturing Corporation: *See*—
Davis, Leland L., 4,539,109, Cl. 210-104.000.

Davies, Richard E. Winding apparatus. 4,538,772, Cl. 242-18.00R.

Davies, Stephen P.; and Thompson, Morice W., to Imperial Chemical Industries PLC. Polymerization process. 4,539,362, Cl. 524-458.000.

Davis, Leland L., to Davco Manufacturing Corporation. Drain system for fuel processor apparatus. 4,539,109, Cl. 210-104.000.

Davis, Mark F., to DBX, Inc. Adaptive signal weighting system. 4,539,526, Cl. 330-144.000.

Davis, Paul C.; Jackson, Raymond G.; Nahas, Joseph J.; Nelson, Dale H.; Ong, DeWitt G.; and Wittman, Brian A., to AT&T Bell Laboratories. Digital-to-analog converter. 4,539,552, Cl. 340-347.0DA.

Dawe, Peter R.: *See*—
Winter, Maurice J.; and Dawe, Peter R., 4,539,214, Cl. 426-557.000.

Dayco Corporation: *See*—
Gayer, Melvin D., 4,539,000, Cl. 474-13.000.

DBX, Inc.: *See*—
Davis, Mark F., 4,539,526, Cl. 330-144.000.

Dearborn Chemicals Limited: *See*—
Clifford, Richard P.; and Birchall, Gerrard A., 4,539,071, Cl. 162-161.000.

DeBruler, Dennis L., to AT&T Bell Laboratories. Method and apparatus for handling interprocessor calls in a multiprocessor system. 4,539,637, Cl. 364-200.000.

Dec, Anthony F.: *See*—
Schweid, Jeffrey M.; Cohee, Arthur H.; and Dec, Anthony F., 4,539,215, Cl. 426-589.000.

De Clercq, Pierre J.: *See*—
Vandewalle, Maurits; Vanmaele, Luc J.; De Clercq, Pierre J.; Halkes, Sebastianus J.; and Overbeek, Wilhelmus R. M., 4,539,153, Cl. 260-397.200.

Dederich, Stanley S.; Schoenfelder, George A.; and Koster, William M., to Pittway Corporation. Combustion products detector with accelerated test. 4,539,556, Cl. 340-515.000.

Deere & Company: *See*—
Landphair, Donald K.; and Doering, James P., 4,539,246, Cl. 428-131.000.

Degner, Dieter; Hannebaum, Heinz; Siegel, Hardo; and Gramlich, Walter, to BASF Aktiengesellschaft. Preparation of benzaldehyde dialkyl acetals. 4,539,081, Cl. 204-78.000.

DeGooyer, William J., to Celanese Corporation. Novolac based epoxy resin curing agents for use in aqueous systems. 4,539,347, Cl. 523-404.000.

Deguchi, Masahiro; Moriya, Mitsuro; Wakami, Noboru; Goto, Yasuhiro; and Shiragami, Kazuharu, to Matsushita Electric Industrial Co., Ltd. Control system for optical information signal reproduction device. 4,539,664, Cl. 369-44.000.

Deguchi, Takayuki: *See*—
Fujii, Tsuneo; Inukai, Hiroshi; Deguchi, Takayuki; Amano, Toshihiko; Kakuchi, Masami; Asakawa, Hiroshi; and Kogure, Osamu, 4,539,250, Cl. 428-195.000.

Degussa Aktiengesellschaft: *See*—
Arntz, Dietrich; Prescher, Gunter; Burkhardt, Werner; Heilos, Johannes; and Manner, Reinhard, 4,539,409, Cl. 546-286.000.

Deissenberger, Hans. Apparatus for the spindleless mounting, as well as the cutting and cutting to length and simultaneous measurement of spools. 4,538,775, Cl. 242-129.510.

Delagi, Richard G.: *See*—
Trenkler, George; and Delagi, Richard G., 4,538,756, Cl. 228-118.000.

Delahoussaye, Ronald D.; and Brazell, James W., II, to Georgia Tech Research Institute. Wheelchair anti-rollback mechanism. 4,538,825, Cl. 280-242.0WC.

Delaney, Norma G.; and Gordon, Eric M., to E. R. Squibb & Sons, Inc. Use of diamino ketones as analgesic agents. 4,539,312, Cl. 514-16.000.

Delaney, Samuel T. Adjustable package carrier. 4,538,737, Cl. 211-71.000.

Delaney, Sean; and Montague, Herbert R., to Control Concepts Corporation. AC Power line transient suppressing circuit. 4,539,617, Cl. 361-58.000.

DeLange, Richard W. Connector means for use on oil and gas well tubing or the like. 4,538,840, Cl. 285-333.000.

Delebecque, Robert P.: *See*—
Le Marer, Rene ; and Delebecque, Robert P., 4,538,383, Cl. 51-124.00R.

Delgado, Gary M.: *See*—
Sidhu, Pawitter S.; and Delgado, Gary M., 4,539,611, Cl. 360-99.000.
Sidhu, Pawitter S.; and Delgado, Gary M., 4,539,612, Cl. 360-99.000.

Del Rosario, Luis. Fishtank. 4,538,547, Cl. 119-5.000.

DeLue, Norman R., to PPG Industries, Inc. Electro organic method and apparatus for carrying out same. 4,539,080, Cl. 204-74.000.

Demange, Michel: *See*—
Ambroise, Modeste; Demange, Michel; Lebizay, Gerald; Munier, Jean-Marie; and Peyronnenc, Michel H. P., 4,539,678, Cl. 370-86.000.

DeMarco Energy Systems, Inc.: *See*—
Lawrence, John P.; and Felfeli, Manoucher, 4,538,418, Cl. 62-79.000.

Demarest, Henry M., Jr.; and Matesa, Joseph M., to PPG Industries, Inc. Method of calcining and liquefying glass batch. 4,539,030, Cl. 65-27.000.

Demler, Michael J., to General Electric Company. Voltage comparator. 4,539,495, Cl. 307-530.000.

Denbigh, Paul L.; Seddon, Richard J.; and Jones, Bryan F., to Thorn EMI plc. High pressure discharge lamps with means for reducing rectification. 4,539,511, Cl. 313-624.000.

Dennis, Mahlon D., to Strata Bit Corporation. Rotary drill bit. 4,538,691, Cl. 175-393.000.

Deno, Koji: *See*—
Matsui, Isamu; and Deno, Koji, 4,538,407, Cl. 57-22.000.

Dentsply International, Inc.: *See*—
Apairo, Jerry, Jr.; and Heath, Derek E., 4,538,989, Cl. 433-102.000.

Denyo Kabushiki Kaisha: *See*—
Saito, Yoshikazu; and Nakaya, Hiroshi, 4,539,486, Cl. 307-34.000.

de Ridder, Johannes J. M.; Hollingsworth, Michael W.; and Robb, Ian D., to Lever Brothers Company. Dishwashing compositions with an anti-filming polymer. 4,539,144, Cl. 252-526.000.

Derrico, Gene A.: *See*—
Lipson, Melvin A.; Derrico, Gene A.; Tark, Sung Y.; and Yamazaki, Toshio, 4,539,286, Cl. 430-277.000.

DeSoto, Inc.: *See*—
Crockatt, William B.; and Rimma, John, 4,539,047, Cl. 106-268.000.

Detras Training Aids Limited: *See*—
Simpson, Anthony; Peterkin, Stuart M.; Brooksby, Brian T.; and Murray, Harold J., 4,538,991, Cl. 434-12.000.

Detrier, Stephane: *See*—
Valentin, Jean; Suply, Patrick; and Detrier, Stephane, 4,538,652, Cl. 141-57.000.

De Vito, Nicholas A. Hoisting and shackle system. 4,538,850, Cl. 294-89.000.

Dewhurst, John E.; Dormish, Jeffrey F.; and Pantone, Richard S., to Mobay Chemical Corporation. Liquid diphenylmethane diisocyanate compositions. 4,539,156, Cl. 260-453.0SP.

Dewhurst, John E.; Dormish, Jeffrey F.; and Pantone, Richard S., to Mobay Chemical Corporation. Liquid diphenylmethane diisocyanate compositions. 4,539,157, Cl. 260-453.0SP.

Dewhurst, John E.; Dormish, Jeffrey F.; and Pantone, Richard S., to Mobay Chemical Corporation. Liquid diphenylmethane diisocyanate compositions. 4,539,158, Cl. 260-453.0SP.

Deyer, Craig E., to RCA Corporation. Switch arrangement for accessing a computer. 4,539,654, Cl. 364-900.000.

DHR, Incorporated: *See*—
Bornstein, Jonathan G.; and Friedman, Peter S., 4,539,625, Cl. 362-32.000.

DiCello, Robert T., to Ohio State Home Services, Inc. Drainage system and method. 4,538,386, Cl. 52-169.500.

Dick, Heinz: *See—*
Hawlitzki, Christian; and Dick, Heinz, 4,539,626, Cl. 362-66.000.

Didier Engineering: *See—*
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, 4,539,016, Cl. 48-197.00R.

Diederichs, Arthur, to Siemens Aktiengesellschaft. Method for the manufacture of a pack of coated metal laminas for electrical machinery and appliances. 4,538,345, Cl. 29-596.000.

Dieringer, Andrew M.; and Sheperd, Ervin M., to Rexnord Inc. Dual claw spike puller. 4,538,793, Cl. 254-18.000.

Diesel Kiki Co., Ltd.: *See—*
Furukawa, Kenji, 4,538,967, Cl. 417-360.000.
Moriya, Kouichi; and Iwata, Kouki, 4,538,579, Cl. 123-492.000.
Shibuya, Tsunenori, 4,538,976, Cl. 418-133.000.

Dietrich, Klaus; and Kroy, Walter, to Messerschmitt-Boelkow-Blohm GmbH. Image readout method and device. 4,539,598, Cl. 358-213.000.

Dietrich, William J., Sr., to DMI, Inc. Subsoil plow point. 4,538,689, Cl. 172-700.000.

DiMenna, William S.; and Floyd, David M., to FMC Corporation. Nematicidal isothiazole derivatives. 4,539,328, Cl. 514-372.000.

Dimier, Jean-Pierre, to Salomon S.A. Safety ski binding. 4,538,828, Cl. 280-628.000.

Dinsmore, Mark T., to Transkinetics Systems, Inc. Diversity telemetry receiver having plural spaced antennas. 4,539,710, Cl. 455-134.000.

Diuguid, Lincoln I.: *See—*
Tedeschi, Robert J.; and Diuguid, Lincoln I., 4,539,015, Cl. 44-77.000.

Diwell, Alan F.: *See—*
Harrison, Brian; and Diwell, Alan F., 4,539,311, Cl. 502-304.000.

Dixon, Roy C.: *See—*
Bux, Werner K.; Dixon, Roy C.; and Rothauser, Ernst H., 4,539,679, Cl. 370-88.000.

DMI, Inc.: *See—*
Dietrich, William J., Sr., 4,538,689, Cl. 172-700.000.

Doebber, Thomas W.: *See—*
Biftu, Tesfaye; Hwang, San-Bao; Doebber, Thomas W.; Beattie, Thomas R.; and Shen, Tsung-Ying, 4,539,332, Cl. 514-461.000.

Doering, Howard W., Jr.: *See—*
Sheets, Ronald E.; Barbas, George A.; Doering, Howard W., Jr.; and Bjorkman, John R., 4,539,479, Cl. 250-491.100.

Doering, James P.: *See—*
Landphair, Donald K.; and Doering, James P., 4,539,246, Cl. 428-131.000.

Doetsch, Paul: *See—*
Suhadolnik, Robert J.; Wu, Joseph M.; Doetsch, Paul; and Henderson, Earl E., 4,539,313, Cl. 514-47.000.

Dohmer, Rolf: *See—*
Strothmann, Rolf; and Dohmer, Rolf, 4,539,439, Cl. 179-107.00R.

Doi, Yoshio; Yamakage, Tetsuro; Nakashima, Kunimichi; and Matsuura, Akihiro, to Toyoda Koki Kabushiki Kaisha. Machine tool with tool change function. 4,538,341, Cl. 29-568.000.

Dominion Engineering Works Limited: *See—*
Wisnia, Jack; and Stock, Norman A., 4,538,769, Cl. 241-179.000.

Donuma, Kenichi; Ohashi, Makoto; and Ozeki, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Module for a fiber optic link. 4,539,476, Cl. 250-227.000.

Doring, John D.: *See—*
Proctor, Keith J.; and Doring, John D., 4,538,623, Cl. 128-784.000.

Dormish, Jeffrey F.: *See—*
Dewhurst, John E.; Dormish, Jeffrey F.; and Pantone, Richard S., 4,539,156, Cl. 260-453.0SP.
Dewhurst, John E.; Dormish, Jeffrey F.; and Pantone, Richard S., 4,539,157, Cl. 260-453.0SP.
Dewhurst, John E.; Dormish, Jeffrey F.; and Pantone, Richard S., 4,539,158, Cl. 260-453.0SP.

Dorre, Erhard; Prussner, Peter; and Zichner, Ludwig, to Feldmuhle Aktiengesellschaft. Implantable elbow joint. 4,538,306, Cl. 623-20.000.

Dow Chemical Company, The: *See—*
Abramson, Harold C., Jr., 4,538,953, Cl. 414-608.000.
Fravel, Harold G., Jr.; and Fazio, Michael J., 4,539,416, Cl. 549-496.000.
Hefner, Robert E., Jr., 4,539,377, Cl. 525-401.000.
Johnson, Mark R., 4,539,159, Cl. 260-465.00F.
Malhotra, Sudarshan K., 4,539,039, Cl. 71-94.000.
Mani, Inder; and Gunderman, Glen L., 4,539,373, Cl. 525-203.000.
Murchison, Craig B., 4,539,334, Cl. 518-717.000.
Stack, Eugene V., 4,538,638, Cl. 137-375.000.
Wong, Nang C., 4,538,531, Cl. 111-1.000.

Doyle, Walter M., to Laser Precision Corporation. Dual beam fourier spectrometer. 4,538,910, Cl. 356-346.000.

Dozono, Kichihiko: *See—*
Shinzawa, Motohiro; Arai, Motomi; Roppongi, Shomatsu; Dozono, Kichihiko; and Hasegawa, Yoji, 4,538,413, Cl. 60-303.000.

Drabek, Jozef: *See—*
Kristiansen, Odd; Drabek, Jozef; and Fluck, Victor, 4,539,314, Cl. 514-84.000.

Drackett Company, The: *See—*
Lammert, James E.; Nichols, Charles E.; and Howard, John R., 4,538,318, Cl. 15-171.000.

Dragerwerk Aktiengesellschaft: *See—*
Westrup, Bernhard, 4,539,181, Cl. 422-59.000.

Drake, Gerald E., to Minnesota Mining and Manufacturing Company. Static mixing device. 4,538,920, Cl. 366-177.000.

Draxler, James R.; and Snyder, Richard H., to Brunswick Corporation. Safety stop switch assembly. 4,539,452, Cl. 200-334.000.

Dressel, William G.; and Kucera, William J., to AMSTED Industries Incorporated. Railway wheel rotundity gage. 4,538,357, Cl. 33-203.180.

Dresser Industries, Inc.: *See—*
Aves, William L., Jr., 4,539,053, Cl. 148-19.000.
Chatterjea, Probir K., 4,538,641, Cl. 137-596.100.

Drivetec, Inc.: *See—*
Thompson, Herbert E., 4,539,614, Cl. 360-99.000.

Droeser, Walter. Roller brush for sweeping machines. 4,538,319, Cl. 15-183.000.

Duckwall, Louis R., Jr., to Conoco Inc. Process for producing poly (vinyl acetals). 4,539,369, Cl. 525-61.000.

Duena, Antonio P.: *See—*
Caldero Ges, Jose M.; and Duena, Antonio P., 4,539,331, Cl. 514-400.000.

Duffee, Henry S. Shaft seal. 4,538,820, Cl. 277-11.000.

Dumont, Daniel, to U.S. Philips Corporation. Semiconductor memory having a dynamic discharge circuit. 4,539,659, Cl. 365-226.000.

Dunbar, Richard M. Method and apparatus for providing finely divided powder. 4,538,764, Cl. 241-5.000.

Duncan, John J.; and Zvejnieks, Andrejs, to AZS Corporation. Technology for the production of inverse emulsion polymers. 4,539,368, Cl. 524-748.000.

Dunfield, John C., to Xerox Corporation. Adaptive print hammer damper. 4,538,930, Cl. 400-144.200.

Dunkelberger, David L., to Rohm and Haas Company. Dunkelspersers. 4,539,375, Cl. 525-260.000.

Dunn, Steven T.: *See—*
Barbetta, Angello J.; Gruber, Robert J.; Isganitis, Louis V.; Law, Kock-Yee; Lin, John W.; Koch, Ronald J.; and Dunn, Steven T., 4,539,284, Cl. 430-110.000.

Dunning, Walter B.; and Bundschuh, Robert L., to Clorox Company, The. Trigger sprayer. 4,538,745, Cl. 222-153.000.

Duphar International Research B.V.: *See—*
Vandewalle, Maurits; Vanmaele, Luc J.; De Clercq, Pierre J.; Halkes, Sebastianus J.; and Overbeek, Wilhelmus R. M., 4,539,153, Cl. 260-397.200.

Du Pont de Nemours, E. I., and Company: *See—*
Bissot, Thomas C.; and Li, Stephen, 4,539,084, Cl. 204-98.000.
Blair, Leslie M., 4,539,387, Cl. 528-232.000.
Faulhaber, Mark E., 4,538,915, Cl. 356-431.000.
Fenton, Jeff T.; Lundeen, Allan J.; Mack, Mark P.; and Merrick, Jean A., 4,539,374, Cl. 525-240.000.
Grossa, Mario; Tigler, Dieter H.; and Weinert, Hubert, 4,539,287, Cl. 430-300.000.
Hare, James W., 4,539,170, Cl. 264-176.00F.
Hoh, George L., 4,539,263, Cl. 428-500.000.
Hormadaly, Jacob, 4,539,223, Cl. 427-102.000.
Leyendecker, William R.; and Rapoport, Morris, 4,539,302, Cl. 502-24.000.
Mumaw, Clayton T., 4,539,290, Cl. 430-569.000.

Durazzani, Piero, to Industrie Zanussi S.p.A. Washing machine tub having integral sheet metal band. 4,538,433, Cl. 68-140.000.

Durot, Jean; and Bernard, Jacques, to Societe Degremont. Horizontal-axis aerator for purification of waste water. 4,539,112, Cl. 210-219.000.

Duryee, Peter S.: *See—*
Eng, Benjamin, Jr.; Anholm, John M., Jr.; and Duryee, Peter S., 4,539,550, Cl. 340-347.0AD.

Dusserre, Pierre: *See—*
Potard, Claude; and Dusserre, Pierre, 4,539,173, Cl. 264-570.000.

Dutcher, Daniel P., to Champion International Corporation. Can carton with three ply handle structure. 4,538,759, Cl. 229-52.00B.

Duvall, Leroy F.: *See—*
Armando, Toni E.; Brewer, John R.; Duvall, Leroy F.; and Novotny, John C., 4,539,211, Cl. 426-291.000.

Duyal, Tulay; and Walls, John E., to American Hoechst Corporation. Photosensitive negative diazo composition with two acrylic polymers for photolithography. 4,539,285, Cl. 430-157.000.

Dynachem Corporation: *See—*
Lipson, Melvin A.; Derrico, Gene A.; Tark, Sung Y.; and Yamazaki, Toshio, 4,539,286, Cl. 430-277.000.

Dynasplint Systems, Inc.: *See—*
Hepburn, George R., 4,538,600, Cl. 128-88.000.

Dynatech Laboratories, Incorporated: *See—*
Bender, Charles E., deceased; and Bender, Audrey L., executrix, 4,539,315, Cl. 514-162.000.

Dzjuba, Vladimir F.; Besedin, Vladlen L.; and Birjukov, Boris N., to Odessky Politekhnichesky Institut. Impulse variable speed device. 4,538,474, Cl. 74-63.000.

E. R. Squibb & Sons, Inc.: *See—*
Delaney, Norma G.; and Gordon, Eric M., 4,539,312, Cl. 514-16.000.
Pawelchak, John M.; and Freeman, Frank M., 4,538,603, Cl. 128-156.000.

Eakin, Bertram E.: *See—*
Friedman, Robert H.; and Eakin, Bertram E., 4,539,093, Cl. 208-8.0LE.

Earl, Gregory. Fuel evaporation apparatus and method. 4,538,583, Cl. 123-557.000.

Earley, John R., to Bridge Products, Inc. Tire valve assembly. 4,538,658, Cl. 152-427.000.

Eastman Kodak Company: *See—*
Blount, William W.; and Robinette, William M., 4,539,349, Cl. 523-509.000.
Jackson, Winston J., Jr.; Kuhfuss, Herbert F.; and Watkins, Joseph J., 4,539,390, Cl. 528-303.000.
Marchant, Alan B.; and Howe, Dennis G., 4,539,573, Cl. 346-137.000.
VanSlyke, Steven A.; and Tang, Ching W., 4,539,507, Cl. 313-504.000.

Eaton Corporation: *See—*
Farley, Marvin, 4,539,217, Cl. 427-10.000.
Schutten, Herman P.; Hoppie, Lyle O.; Turner, David; and Chute, Richard, 4,538,642, Cl. 137-625.280.
Williams, Bob J.; and Brors, Daniel L., 4,539,278, Cl. 430-5.000.

Eby, John E.; and Kingston, Charles M., to GTE Products Corporation. Shift register driven video measurement system for microcomputer. 4,539,587, Cl. 358-107.000.

Ecanow, Bernard: *See—*
Ecanow, Charles S.; and Ecanow, Bernard, 4,539,204, Cl. 514-6.000.

Ecanow, Charles S.; and Ecanow, Bernard, to Neomed Inc. Gelatin based synthetic blood and a method of making the same. 4,539,204, Cl. 514-6.000.

Eckels, Phillip W., to Electric Power Research Institute, Inc. Vapor trap for supercooled rotor. 4,538,417, Cl. 62-55.000.

Eckenhoff, James B.; Place, Virgil A.; and Peery, John R., to ALZA Corporation. Self-driven pump assembly and method of operation. 4,539,004, Cl. 604-131.000.

Eckmann, Stuart F. Interactive educational system with voice reaction and access using tone-generating telephone. 4,539,435, Cl. 179-2.00A.

Ed. Zublin Aktiengesellschaft: *See—*
Fastenau, Werner, 4,538,521, Cl. 104-118.000.

Ederer, Ulf: *See—*
Ehrentraut, Otto; and Ederer, Ulf, 4,538,929, Cl. 384-120.000.

Edixhoven, Gerardus H., to Hunter Douglas International N.V. Venetian blind assembly apparatus. 4,538,330, Cl. 29-24.500.

Edmonds, David A.; and Rollins, Winfred B. Method of charging and hermetically sealing a high pressure gas vessel. 4,538,395, Cl. 53-403.000.

Edwards, Michael F.; Barlow, John; Foreman, Frederick A.; and Williams, Gwynne, to GKN Technology Limited. Wear resistant wheel for track laying vehicle. 4,538,860, Cl. 305-56.000.

Egan, Michael J.; and Quill, Gary J., to Williams International Corporation. Method of manufacturing an integral bladed turbine disk. 4,538,331, Cl. 29-156.80R.

Eggert, Albert; and Goldschmidt, Rainer, to Robert Bosch GmbH. Hearing-aid with integrated circuit electronics. 4,539,441, Cl. 179-111.00E.

Eggert, Walter S., Jr., to Budd Company, The. Equalization means for a railway truck. 4,538,524, Cl. 105-182.00R.

Egyt Gyogyszervegyeszeti Gyar: *See—*
Orban, Erno ; Borvendeg, Janos; Nagy, Laszlo ; Sotinee Tolvay, Marta; and Bander, Erzsebet, 4,539,199, Cl. 424-22.000.

Ehrentraut, Otto; and Ederer, Ulf, to Miba Gleitlager Aktiengesellschaft. Hydrodynamic sliding surface bearing. 4,538,929, Cl. 384-120.000.

Ehrmann, Karl; and Gerber, Richard, to Robert Bosch GmbH. Ignition device for internal combustion engines. 4,538,564, Cl. 123-146.50A.

Einarsson, Gudbjartur, to Veltak H/F. Separating and cleaning device for shellfish. 4,538,327, Cl. 17-53.000.

Einhaus, Hermanus F., to U.S. Philips Corporation. Low friction phonograph tone arm traverse. 4,539,672, Cl. 369-244.000.

Eisele, Hermann: *See—*
Straubel, Max; Eisele, Hermann; Leblanc, Jean; and Pigeroulet, Jean, 4,538,580, Cl. 123-494.000.

Elabd, Hammam, to RCA Corporation. CCD Imagers with interleaved image registers using opposed directions of charge transfer. 4,539,596, Cl. 358-213.000.

Elder, James D.: *See—*
Bergeron, Hervin J., Jr., 4,538,507, Cl. 98-31.500.

Electric Power Research Institute, Inc.: *See—*
Eckels, Phillip W., 4,538,417, Cl. 62-55.000.
Kelley, Douglas P., 4,538,522, Cl. 104-287.000.

Electrophysics Corporation: *See—*
Lindner, Robert W.; and Vallese, Lucio M., deceased, 4,539,589, Cl. 358-113.000.

Elevator GmbH: *See—*
Saaksjarvi, Paavo, 4,539,636, Cl. 364-200.000.

Eli Lilly and Company: *See—*
Wright, Ian G., 4,539,422, Cl. 560-155.000.

Elkem a/s: *See—*
Butcher, Anthony V.; and Hatt, Brian W., 4,539,124, Cl. 252-28.000.
Halvorsen, Gunnar, 4,539,194, Cl. 423-348.000.

Ellis, J. Nigel; and Ostrobrod, Meyer, to Research & Trading Corporation. Climbing aid and safety descent system. 4,538,703, Cl. 182-5.000.

Ellis, James S.: *See—*
Harben, Grover S., Jr.; Ellis, James S.; and Emmett, Joe M., 4,538,325, Cl. 17-45.000.

Ellis, Michael F.: *See—*
Merrell, Philip H.; and Ellis, Michael F., 4,539,428, Cl. 564-430.000.

Elmar Industries, Inc.: *See—*
Minard, Everett S., 4,538,788, Cl. 251-107.000.

Emhart Industries, Inc.: *See—*
Melody, Brian, 4,539,146, Cl. 252-62.200.

Emil Suter Maschinenfabrik AG: *See—*
Binggeli, Rudolf, 4,538,334, Cl. 29-243.500.

Emmett, Joe M.: *See—*
Harben, Grover S., Jr.; Ellis, James S.; and Emmett, Joe M., 4,538,325, Cl. 17-45.000.

Endo, Sadayoshi: *See—*
Hayashi, Hideki; Takagi, Satoshi; Ito, Yukio; and Endo, Sadayoshi, 4,538,753, Cl. 226-199.000.

Energiagazdalkodasi Intezet: *See—*
Bodas, Janos; Bakay, Arpad; Papp, Istvan; Palfalvi, Gyorgy; and Kovacs, Gyula, 4,538,677, Cl. 165-146.000.

Eng, Benjamin, Jr.; Anholm, John M., Jr.; and Duryee, Peter S., to John Fluke Mfg. Co., Inc. Analog to digital converter using recirculation of remainder. 4,539,550, Cl. 340-347.0AD.

Engel, Gerhard: *See—*
Buck, Rainer; Engel, Gerhard; Kuttner, Thomas; Sautter, Wilfried; and Wessel, Wolf, 4,538,571, Cl. 123-357.000.

Engelbrecht, Eckart; Nieder, Elmar; and Keller, Arnold, to GMT Gesellschaft fur medizinische Technik mbH; and Waldemar Link GmbH & Co. Articulated prosthesis. 4,538,305, Cl. 623-20.000.

Engelhard Corporation: *See—*
Oyekan, Soni O., 4,539,307, Cl. 502-223.000.

English, Donald C.; and Hicks, Bruce W., to Rio Linda Chemical Co., Inc. Foam generating and distributing manifold apparatus. 4,538,545, Cl. 118-679.000.

English, Stanley R.: *See—*
Danna, Dominick; Wheeler, Robert C.; and English, Stanley R., 4,539,586, Cl. 358-98.000.

Engman, Bo H. S., to Permobil AB. Foot rest arrangement for wheelchairs. 4,538,857, Cl. 297-437.000.

Equipements Automobiles Marchal: *See—*
Muller, Guy L.; Fraioli, Daniel F.; and Oulie, Michel B., 4,539,185, Cl. 422-233.000.

Ericsson, Sylve J. D., to Svecia Silkscreen Maskiner AB. Drying plant for drying printed material. 4,538,358, Cl. 34-4.000.

Erwin Sick GmbH Optik-Elektronik: *See—*
Sick, Erwin, 4,538,536, Cl. 112-273.000.

Escher Wyss GmbH: *See—*
Mayr, Hermann; Kahmann, Albrecht; Lambrecht, Gerhard; Heinbockel, Wolfgang; Siewert, Wolfgang; and Maier, Josef, 4,538,765, Cl. 241-21.000.

Eskildsen, Jim: *See—*
Benedict, Gary F.; and Eskildsen, Jim, 4,539,461, Cl. 219-121.00L.

Esola, John L.: *See—*
Bruce, Daniel E.; and Esola, John L., 4,538,458, Cl. 73-233.000.

Espelage, Paul M.; and Nowak, James M., to General Electric Company. Start-up control for an induction motor drive. 4,539,514, Cl. 318-778.000.

Esper, Friedrich; Friese, Karl-Hermann; Gohl, Walter; and Sternad, Peter, to Robert Bosch GmbH. Rapid-heating, high-temperature-stable spark plug for internal combustion engines. 4,539,503, Cl. 313-11.500.

Esselte Pendaflex Corporation: *See—*
Berger, Barry D., 4,538,736, Cl. 211-69.500.

Este, Grantley O.; Suthers, Mark S.; and Streater, Richard W., to Northern Telecom Limited. Magnetic feedthrough cancelling surface acoustic wave device. 4,539,502, Cl. 310-313.00B.

Etablissements F. Valentin: *See—*
Valentin, Jean; Suply, Patrick; and Detrier, Stephane, 4,538,652, Cl. 141-57.000.

Etablissements Morillon: *See—*
Morillon, Theodore, 4,538,505, Cl. 91-518.000.

Ethyl Corporation: *See—*
Chung, James Y. J.; Jones, Jesse D.; and Li, Hsueh M., 4,539,352, Cl. 524-109.000.
Ramachandran, Venkataraman, 4,539,397, Cl. 534-556.000.

Etudes Techniques et Realisations (CdF Ingenierie) S.A.: *See—*
Pasquier, Armand, 4,538,369, Cl. 37-219.000.

Evans & Sutherland Computer Corp.: *See—*
Gaffney, John, 4,539,638, Cl. 364-300.000.

Everett, Robert D.: *See—*
Gray, Matthew H.; and Everett, Robert D., 4,538,719, Cl. 194-100.00A.

Ewing, John J.: *See—*
Fecik, Michael T.; Bennett, Terry A.; and Ewing, John J., 4,539,031, Cl. 65-29.000.

Ewing, Peter D., to National Set Screw. Method of making a sucker rod assembly. 4,538,339, Cl. 29-510.000.

Exxon Research and Engineering Co.: *See—*
Lewis, Arthur M.; and Scudo, Aldo, 4,539,568, Cl. 346-1.100.
Merchant, Philip; and Wunderlich, R. Roger, 4,539,099, Cl. 208-177.000.

F.A.I.P. S.p.A.: *See—*
Franco, Boccaletti, 4,538,660, Cl. 157-20.000.

F. F. Seeley Nominees Pty. Ltd.: *See—*
Seeley, Frederic F., 4,538,526, Cl. 108-127.000.

Fabre, Jean-Louis; Farge, Daniel; James, Claude; and Lave , Daniel, to Rhone-Poulenc Sante. Pyridin-3-yl substituted ortho-fused pyrrole derivatives. 4,539,400, Cl. 544-47.000.

Fachini, Robert M., to J. I. Case Company. Narrow row cotton harvester and picker unit. 4,538,403, Cl. 56-44.000.

Faddis, Chris G.: *See—*
Usry, Joe D.; Bunnell, James B.; and Faddis, Chris G., 4,538,604, Cl. 128-204.230.

Faehnle, Erich, to PKA Pyrolyse Kraftanlagen GmbH. Gas converter. 4,538,528, Cl. 110-229.000.

Fairchild Camera & Instrument Corporation: *See*—
Wilson, Verne H.; Blaser, Lawrence M.; and Arguello, Leonard E., 4,538,585, Cl. 123-609.000.

Fanger, Hans-Ulrich: *See*—
Michaelis, Walfried; Fanger, Hans-Ulrich; and The, Hans L., 4,539,649, Cl. 364-558.000.

Fantasy Flavors, Inc.: *See*—
Petersen, Benjamin R., Jr., 4,538,740, Cl. 215-246.000.

Farge, Daniel: *See*—
Fabre, Jean-Louis; Farge, Daniel; James, Claude; and Lave , Daniel, 4,539,400, Cl. 544-47.000.

Farley, Marvin, to Eaton Corporation. Dose control method. 4,539,217, Cl. 427-10.000.

Farnum, Henry M. Circumferential stereo spectacular, 360 degrees vertically and horizontally, with live center stage built by economical, universal construction devices. 4,538,394, Cl. 52-664.000.

Fastenau, Werner, to Ed. Zublin Aktiengesellschaft. Recessible guide rail arrangement for a wheel-supported vehicle. 4,538,521, Cl. 104-118.000.

Faulhaber, Mark E., to Du Pont de Nemours, E. I., and Company. Web inspection system having a product characteristic signal normalizing network. 4,538,915, Cl. 356-431.000.

Fazio, Michael J.: *See*—
Fravel, Harold G., Jr.; and Fazio, Michael J., 4,539,416, Cl. 549-496.000.

Fearon, Edward R., to Shin International, Inc. Antitheft system. 4,539,558, Cl. 340-572.000.

Fecik, Michael T.; Bennett, Terry A.; and Ewing, John J., to PPG Industries, Inc. Apparatus for press shaping hot glass sheets. 4,539,031, Cl. 65-29.000.

Feldmuhle Aktiengesellschaft: *See*—
Dorre, Erhard; Prussner, Peter; and Zichner, Ludwig, 4,538,306, Cl. 623-20.000.

Felfeli, Manoucher: *See*—
Lawrence, John P.; and Felfeli, Manoucher, 4,538,418, Cl. 62-79.000.

Felix, Andre B.: *See*—
Trussell, Gerald C.; Felix, Andre B.; Hembree, Thomas D.; and Rollins, Paul F., 4,539,655, Cl. 364-900.000.

Fenton, Jeff T.; Lundeen, Allan J.; Mack, Mark P.; and Merrick, Jean A., to Du Pont de Nemours, E. I., and Company. Polyolefin with improved processing properties. 4,539,374, Cl. 525-240.000.

Ferag AG: *See*—
Honegger, Werner; and Burgi, Hanspeter, 4,539,470, Cl. 235-98.00B.

Ferguson, Larry W.: *See*—
Hager, Thomas P.; and Ferguson, Larry W., 4,539,021, Cl. 55-97.000.

Ferix Corporation: *See*—
Springer, Gilbert D., 4,539,280, Cl. 430-39.000.

Ferrell, Gary W.: *See*—
Palmer, David N.; and Ferrell, Gary W., 4,539,052, Cl. 148-6.240.

Ferrell, James C., to Club Car, Inc. Choke assembly for golf cart. 4,539,162, Cl. 261-1.000.

Ferrero S.p.A.: *See*—
Cillario, Lorenzo, 4,538,731, Cl. 206-540.000.

Ferro, Gregory A.: *See*—
Lee, Raymond; Okey, David W.; and Ferro, Gregory A., 4,539,342, Cl. 521-189.000.

Feuerbaum, Hans-Peter; and Schmitt, Reinhold, to Siemens Aktiengesellschaft. Method and apparatus for suppressing disturbances in the measurement of signals with a particle probe. 4,539,477, Cl. 250-310.000.

Fiat Auto S.p.A.: *See*—
Lombardi, Claudio, 4,538,574, Cl. 123-432.000.

Field, Leslie A., to Chevron Research Company. Pretreatment method for increasing conversion of reforming catalyst. 4,539,304, Cl. 502-66.000.

Field, Leslie A.: *See*—
Wilson, Charles R.; Buss, Waldeen C.; and Field, Leslie A., 4,539,305, Cl. 502-66.000.

Fielding, Lawrence E., to United States of America, Air Force. Loading dolly. 4,538,792, Cl. 259-8.00R.

Fievet, Fernand: *See*—
Figlarz, Michel; Fievet, Fernand; and Lagier, Jean-Pierre, 4,539,041, Cl. 75-0.50A.

Figlarz, Michel; Fievet, Fernand; and Lagier, Jean-Pierre, to Universite Paris VII. Process for the reduction of metallic compounds by polyols, and metallic powders obtained by this process. 4,539,041, Cl. 75-0.50A.

Figueroa, Carlos A. Commodities trading games of skill and chance. 4,538,816, Cl. 273-256.000.

Filippini, Andrea; and Carobbi, Renato, to Sirac SpA. Process for preparing alpha-L-aspartyl-L-phenylalanine alkyl esters. 4,539,147, Cl. 260-112.50R.

Filmer, Dierk: *See*—
Sawatzki, Harry L.; Koller, Markus; and Schaedler, Hansjorg, 4,538,301, Cl. 2-2.000.

Fisher, Chester: *See*—
Tran, Danh C.; and Fisher, Chester, 4,539,032, Cl. 65-32.000.

Fisher, David A., to International Standard Electric Corporation. Echo canceller. 4,539,675, Cl. 370-32.000.

Fishman, Herbert; and Rogers, Alvin J., to Systems Engineering & Manufacturing Corp. Printed circuit board component conveyor apparatus and process. 4,539,069, Cl. 156-640.000.

Flamm, Peter M.; Mlynek, Daniel; Schmidtpott, Friedrich; and Praxmarer, Alfred, to ITT Industries, Inc. Digital integrated chrominance-channel circuit with gain control. 4,539,583, Cl. 358-27.000.

Flautt, Martin C.: *See*—
Pollet, Jean-Claude; Flautt, Martin C.; and Armstrong, Gordon P., 4,539,364, Cl. 524-488.000.

Fleck, David C.; Novak, Joseph H.; and Koerber, Clement J., Sr., to Hill-Rom Company, Inc. Bed departure detection system. 4,539,560, Cl. 340-573.000.

Fletcher, Keith: *See*—
Phillips, Richard A.; Fletcher, Keith; and Naylor, Peter W., 4,539,468, Cl. 219-330.000.

Flexibox Limited: *See*—
Wallace, Neil M., 4,538,821, Cl. 277-81.00R.

Flick, Robert H.; and Huffman, Walter K., to Westinghouse Electric Corp. Molded case circuit breaker with movable upper electrical contact positioned by tension springs. 4,539,538, Cl. 335-16.000.

Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, to Thyssengas G.m.b.H.; and Didier Engineering. Method of and apparatus for adjusting and maintaining constant the temperature during methanizing of a charge gas. 4,539,016, Cl. 48-197.00R.

Flora, Laurence P., to Burroughs Corporation. Method for testing an integrated circuit chip without concern as to which of the chip's terminals are inputs or outputs. 4,539,517, Cl. 324-73.00R.

Flower, Milton O.: *See*—
Glover, Loren J.; Flower, Milton O.; and Pinassi, David J., 4,538,725, Cl. 206-37.000.

Floyd, David M.: *See*—
DiMenna, William S.; and Floyd, David M., 4,539,328, Cl. 514-372.000.

Fluck, Victor: *See*—
Kristiansen, Odd; Drabek, Jozef; and Fluck, Victor, 4,539,314, Cl. 514-84.000.

FMC Corporation: *See*—
DiMenna, William S.; and Floyd, David M., 4,539,328, Cl. 514-372.000.
Sethi, Dalbir S.; Meadow, Morton; and Scarito nee Bagnall, Elizabeth A., 4,539,196, Cl. 423-588.000.

Fokker B.V.: *See*—
Sarin, Sohan L.; and Zandbergen, Teun, 4,539,245, Cl. 428-116.000.

Folser, Karl: *See*—
Theurer, Josef; and Folser, Karl, 4,538,686, Cl. 171-16.000.

Ford, John M. B.; and Foster, Donald D., to Realex Corporation. Tamper deterring unlocking restricter for down locking pump dispensers. 4,538,748, Cl. 222-321.000.

Ford Motor Company: *See*—
Hawlitzki, Christian; and Dick, Heinz, 4,539,626, Cl. 362-66.000.
Lobo, Claude; and Burger, Peter, 4,538,852, Cl. 296-91.000.
Lunt, Martin R., 4,538,570, Cl. 123-337.000.
Melotik, Donald J.; Weintraub, Marvin H.; and Anderson, Arnold E., 4,539,233, Cl. 427-388.100.
Nagy, George, Jr.; and Rowan, Clement W., 4,539,547, Cl. 340-59.000.
Wade, Wallace R.; and Rao, Vemulapalli Durga N., 4,538,411, Cl. 60-274.000.

Foreman, Frederick A.: *See*—
Edwards, Michael F.; Barlow, John; Foreman, Frederick A.; and Williams, Gwynne, 4,538,860, Cl. 305-56.000.

Forester, Robert J.: *See*—
Yeazel, Kenneth L.; and Forester, Robert J., 4,538,951, Cl. 414-407.000.

Formosa Plastics Corporation: *See*—
Cheng, Cheng-Yi; Lee, Shou-Yuan; Chen, Kwang-Ming; and Hong, Won-Doon, 4,539,380, Cl. 526-78.000.

Fornas, Mikael; Sipila , Raimo; and Lehto, Altti, to Raupak Oy. Dust bag for use in a vacuum cleaner. 4,539,027, Cl. 55-378.000.

Forrest, William E., to Advanced Evacuation Systems. Multiple-person evacuation method and apparatus. 4,538,704, Cl. 182-10.000.

Fortune, Douglas N.; and Ireland, Barry R., to Soil Mate Equipment Ltd. Stone guard door for harvesters. 4,538,625, Cl. 130-27.0JT.

Fortune, Neil: *See*—
Latimer, John; and Fortune, Neil, 4,538,510, Cl. 99-459.000.

Foster, Donald D.: *See*—
Ford, John M. B.; and Foster, Donald D., 4,538,748, Cl. 222-321.000.

Foster, William Z.: *See*—
Brockington, F. Rhett; and Foster, William Z., 4,539,248, Cl. 428-161.000.

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Bergstrom, Sheryl L.; and Foutch, Gary L., 4,539,293, Cl. 435-160.000.

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Winchell, David A.; and Fowles, Thomas A., 4,539,172, Cl. 264-515.000.

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Muller, Guy L.; Fraioli, Daniel F.; and Oulie, Michel B., 4,539,185, Cl. 422-233.000.

France, Paul W.: *See*—
Beales, Keith J.; Carter, Steve F.; Partington, Sally; and France, Paul W., 4,539,033, Cl. 65-134.000.

Francis, William L. Continuous electroplating device. 4,539,090, Cl. 204-198.000.

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Metcalfe, Lincoln D.; and Frank, Dieter, 4,539,294, Cl. 435-180.000.

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Theurer, Josef; and Folser, Karl, 4,538,686, Cl. 171-16.000.
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Pawelchak, John M.; and Freeman, Frank M., 4,538,603, Cl. 128-156.000.

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Robbins, William B.; Willson, Richard F.; and Freese, Robert P., 4,539,572, Cl. 346-135.100.

Frei, Siegfried, to Cantec, Incorporated. Cans formed of thin-walled material and apparatus for forming precise fine beads therein. 4,538,439, Cl. 72-105.000.

French, Don M., to United States of America, Navy. Digital MSK modulator. 4,539,533, Cl. 332-9.00R.

French, James C.: *See*—
Brankiewicz, Alex J.; Bunge, Richard H.; French, James C.; Hokanson, Gerard C.; Hurley, Timothy R.; and Schaumberg, John P., 4,539,203, Cl. 424-117.000.

Frensley, William: *See*—
Bayraktaroglu, Burhan; Kim, Bumman; and Frensley, William, 4,539,528, Cl. 330-287.000.

Fresenius AG: *See*—
Krutten, Viktor, 4,538,836, Cl. 285-24.000.

Frieberg, Bengt O., to Nobex AB. Method of forming a joined pair of wedge-action lock washers. 4,538,313, Cl. 10-86.00B.

Friedman, Peter S.: *See*—
Bornstein, Jonathan G.; and Friedman, Peter S., 4,539,625, Cl. 362-32.000.

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Friedrich, Bodo: *See*—
Luecke, Wolfgang; Beneke, Herbert; and Friedrich, Bodo, 4,539,388, Cl. 528-271.000.

Friedrich, Heinz: *See*—
Burger, Kurt; and Friedrich, Heinz, 4,539,059, Cl. 156-251.000.

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Esper, Friedrich; Friese, Karl-Hermann; Gohl, Walter; and Sternad, Peter, 4,539,503, Cl. 313-11.500.

Friesen, Paul F., to Armstrong World Industries, Inc. Positively vented flat roof system. 4,538,388, Cl. 52-199.000.

Frith, Donald E. Shrinkage compensated measuring device. 4,538,352, Cl. 33-1.00B.

Fritz, Frank: *See*—
Knutson, Dale A.; and Fritz, Frank, 4,538,644, Cl. 137-625.640.

Frushtick, Leonard, to Leonard Automatics, Inc. Waist expander for trouser finisher. 4,538,370, Cl. 38-42.000.

Fry, Bradley; and Wexler, Alvin, to Tasc Ltd. Reconstruction system and methods for impedance imaging. 4,539,640, Cl. 364-414.000.

Frye, Kenneth G.; and Karis, Arthur T., to Beloit Corporation. Curl neutralizer. 4,539,072, Cl. 162-197.000.

Fryer, Alan. Portable computer classroom. 4,538,995, Cl. 434-432.000.

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Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,539,155, Cl. 260-112.50R.

Fuji Photo Film Co., Ltd.: *See*—
Ichikawa, Yasunori; Yamaguchi, Shigeru; Kojima, Akira; and Fujiwara, Kazuhiko, 4,539,139, Cl. 252-314.000.
Igarashi, Akira; and Matsukawa, Hiroharu, 4,539,578, Cl. 346-207.000.
Inoue, Nobuaki; Mifune, Hiroyuki; and Nakamura, Koki, 4,539,291, Cl. 430-597.000.
Kohda, Katsuhiro; and Takahashi, Kenji, 4,539,137, Cl. 252-301.40H.
Miyahara, Junji; Nakamura, Takashi; and Takahashi, Kenji, 4,539,138, Cl. 252-301.40H.
Ryoke, Katsumi; Masuyama, Kenichi; Yoneyama, Takashi; Nasu, Norio; and Tadokoro, Eiichi, 4,539,257, Cl. 428-323.000.
Saito, Tsutomu; and Mihayashi, Keiji, 4,539,289, Cl. 430-506.000.
Shirane, Hideto, 4,538,894, Cl. 354-467.000.

Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; Inoue, Teruhiko; and Oomori, Kiyosi, to UBE Industries, Ltd. Process for the preparation of a 2-alkyl-4-amino-5-aminomethylpyrimidine. 4,539,403, Cl. 544-326.000.

Fujii, Kunishisa; Yoshino, Kosei; and Nakazawa, Masami, to Takamisawa Electric Co., Ltd. Core structure for an electromagnetic relay. 4,539,543, Cl. 335-281.000.

Fujii, Tetsuya: *See*—
Sakuraya, Toshikazu; Fujii, Tetsuya; Matsui, Shigeo; and Hayashi, Shigeki, 4,539,020, Cl. 55-26.000.

Fujii, Tsuneo; Inukai, Hiroshi; Deguchi, Takayuki; Amano, Toshihiko; Kakuchi, Masami; Asakawa, Hiroshi; and Kogure, Osamu, to Daikin Kogyo Co. Ltd.; and Nippon Telegraph & Telephone Public Corporation. Resist material and process for forming fine resist pattern. 4,539,250, Cl. 428-195.000.

Fujiie, Kazuhiko, to Sony Corporation. Disc players. 4,539,667, Cl. 369-50.000.

Fujikawa, Motoi: *See*—
Kagata, Tooru; and Fujikawa, Motoi, 4,538,714, Cl. 192-54.000.

Fujikawa, Tetsuzo; and Abe, Shinji, to Kawasaki Jukogyo Kabushiki Kaisha. Two-stroke cycle multispark ignition type gasoline engine. 4,538,568, Cl. 123-310.000.

Fujiki, Masao, to Tokyo Shibaura Denki Kabushiki Kaisha. Servo track configuration for magnetic disk apparatus. 4,539,607, Cl. 360-77.000.

Fujimoto, Hideki: *See*—
Nishioka, Akira; Kawanabe, Yoshihiro; Takahori, Hiroyuki; and Fujimoto, Hideki, 4,539,491, Cl. 307-297.000.

Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. 4-(2-Bornyloxy)-2-butyn-1-ol and organoleptic uses thereof. 4,539,142, Cl. 252-522.00R.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Hashimoto, Masashi; Aratani, Matsuhiko; and Sawada, Kozo, 4,539,152, Cl. 260-245.20T.

Fujita, Eiichi: *See*—
King, Ming L.; Chiang, Chin-Chih; Ling, Han-Chin; Ochiai, Masahito; Fujita, Eiichi; and McPhail, Andrew T., 4,539,414, Cl. 549-458.000.

Fujita, Yasuhiko; and Masuda, Eiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Differential voltage amplifier. 4,539,551, Cl. 340-347.0AD.

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Fujitsu Fanuc Limited: *See*—
Inaba, Hajimu; Inagaki, Shigemi; and Ito, Susumu, 4,538,639, Cl. 137-580.000.

Fujitsu Limited: *See*—
Akasaki, Hidehiko, 4,539,622, Cl. 361-401.000.
Kurafuji, Setsuo, 4,539,494, Cl. 307-530.000.
Oritani, Atushi, 4,539,661, Cl. 365-230.000.
Takagi, Mikio; Takasaki, Kanetake; and Koyama, Kenji, 4,539,068, Cl. 156-614.000.

Fujitsu-Ten, Ltd.: *See*—
Ito, Tatsuo, 4,539,712, Cl. 455-184.000.

Fujiwara, Akinori: *See*—
Kawaguchi, Teruhiko; Nishimura, Yuji; and Fujiwara, Akinori, 4,538,774, Cl. 242-107.000.

Fujiwara, Kazuhiko: *See*—
Ichikawa, Yasunori; Yamaguchi, Shigeru; Kojima, Akira; and Fujiwara, Kazuhiko, 4,539,139, Cl. 252-314.000.

Fujiwara, Michiaki: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,538,329, Cl. 19-244.000.

Fujiwara, Takashi: *See*—
Imaizumi, Mamoru; and Fujiwara, Takashi, 4,538,933, Cl. 400-582.000.

Fukazawa, Nobuyuki: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; and Shirakawa, Isao, 4,539,150, Cl. 260-239.30B.
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Fukuda, Tadaji: *See*—
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,539,283, Cl. 430-61.000.

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Washizuka, Syoichi; Ushizawa, Jisaburo; Kokubun, Yoshihiro; and Fukuda, Tsuguo, 4,539,067, Cl. 156-601.000.

Fukuda, Yutaka; and Sasaki, Kenichi, to Daicel Chemical Industries, Ltd. Lactone-modified diol. 4,539,394, Cl. 528-354.000.

Fukumoto, Masafumi, to Nisshin Chemical Industry Co., Ltd. Heat exchanging device. 4,538,678, Cl. 165-162.000.

Fun-Tech Products Company: *See*—
Orlowski, Gerald J., 4,538,999, Cl. 446-259.000.

Furukawa, Hisao: *See*—
Kato, Yasushi; and Furukawa, Hisao, 4,539,359, Cl. 524-376.000.

Furukawa, Kenji, to Diesel Kiki Co., Ltd. Blower. 4,538,967, Cl. 417-360.000.

Furukawa, Yoshimi; and Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Steering device for vehicle. 4,538,824, Cl. 280-91.000.

Furutsu, Akira, to Japan Bano'k Co., Ltd.; and Ben Clements & Sons, Inc. Fastener dispensing device. 4,538,754, Cl. 227-67.000.

Furuya, Mikihito: *See*—
Wakabayashi, Tsutomu; and Furuya, Mikihito, 4,538,865, Cl. 339-17.00F.

Futaba Denshi Kogyo K.K.: *See*—
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,539,054, Cl. 148-403.000.

G. W. Lisk Company, Inc.: *See*—
Clark, Bruce D., 4,539,542, Cl. 335-261.000.

Gademann, Lothar: *See*—
Michel, Hartmut; Gademann, Lothar; and Jesse, Erich, 4,539,492, Cl. 307-315.000.

GAF Corporation: *See*—
Nelsen, Suzanne B., 4,539,356, Cl. 524-166.000.

Gaffney, John, to Evans & Sutherland Computer Corp. Command language system for interactive computer. 4,539,638, Cl. 364-300.000.

Gage, Richard J. Method and apparatus for processing optical tracking signals. 4,539,590, Cl. 358-125.000.

Gagliani, John: *See*—
Long, John V.; and Gagliani, John, 4,539,336, Cl. 521-77.000.

Gagne, Pierre; Girardeau, Yvette; and Pointud, Bernard, to Rhone-Poulenc Specialites Chimiques. Sizing composition and method of making same and use thereof for sizing textile yarns. 4,539,366, Cl. 524-507.000.

Gaida, Wolfram: *See*—
Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Gaida, Wolfram, 4,539,323, Cl. 514-260.000.

Gajria, Chandrasen; and Ozari, Yehuda, to Celanese Corporation. Water-swellable crosslinked polymeric microgel particles and aqueous dispersions of organic film-forming resins containing the same. 4,539,348, Cl. 523-409.000.

Galbreath, Ronald E.; and Harrison, Bruce R., to Commonwealth of Australia, The. Photogrammetric stereoplotter. 4,539,701, Cl. 382-1.000.

Gambro Engstrom AB: *See*—
Gedeon, Andras; and Odselius, Leif, 4,538,605, Cl. 128-205.240.

Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., to U.S. Philips Corporation. Circuit arrangement for starting and operating a high-pressure gas discharge lamp. 4,539,513, Cl. 315-176.000.

Gardell, Harry L.: *See*—
Brady, Robert T.; and Gardell, Harry L., 4,538,551, Cl. 122-367.00R.

Gardner, F. Philip, to Interco, Incorporated. Electronic foot measuring apparatus and method. 4,538,353, Cl. 33-3.00C.

Garner-Gray, Peter F., to Lever Brothers Company. Solid detergent composition containing sodium perborate monohydrate having specified surface area. 4,539,131, Cl. 252-99.000.

Garrett Corporation, The: *See*—
Benedict, Gary F.; and Eskildsen, Jim, 4,539,461, Cl. 219-121.00L.

Gayer, Melvin D., to Dayco Corporation. Method of making belt tensioning means. 4,539,000, Cl. 474-13.000.

Gecks, Donald L.: *See*—
Graham, Marshall D.; Cook, Dudley D., Jr.; Gecks, Donald L.; and Shaw, Robert, 4,538,885, Cl. 350-529.000.

Gedeon, Andras; and Odselius, Leif, to Gambro Engstrom AB. Anesthetic apparatus. 4,538,605, Cl. 128-205.240.

Geist, Michael, to BASF Farben & Fasern AG. Synthetic resin. 4,539,218, Cl. 427-27.000.

Geist, Michael; and Ott, Gunther, to BASF Farben & Fasern AG. Self-crosslinking, heat-curable grinding resin. 4,539,385, Cl. 528-100.000.

General Dryer Corporation: *See*—
Heimark, Charles J., Jr.; and Heimark, Charles J., Sr., 4,538,404, Cl. 56-314.000.

General Dynamics Corporation: *See*—
Merrick, James W., 4,538,573, Cl. 123-418.000.

General Dynamics Corporation/Convair Div.: *See*—
Clifton, James E.; and Carlson, Ronald F., 4,538,943, Cl. 408-14.000.
Morghen, Manfred, 4,538,355, Cl. 33-180.00R.

General Electric Company: *See*—
Abeelen, Petrus C. A. M. V.; Bussink, Jan; and Heuschen, Jean M. H., 4,539,350, Cl. 523-527.000.
Beers, Dale M., 4,539,367, Cl. 524-731.000.
Bobear, William J., 4,539,357, Cl. 524-267.000.
Brady, Joseph H.; Koenig, Albert A.; and Straub, Harry, 4,538,834, Cl. 285-10.000.
Brun, Milivoj K. Lee, Minyoung; and Szala, Lawrence E., 4,539,141, Cl. 252-516.000.
Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., 4,539,299, Cl. 501-96.000.
Demler, Michael J., 4,539,495, Cl. 307-530.000.
Espelage, Paul M.; and Nowak, James M., 4,539,514, Cl. 318-778.000.
Hallgren, John E., 4,539,379, Cl. 525-446.000.
Kast, Howard B., 4,538,504, Cl. 91-461.000.
Klufas, Oleg, 4,538,455, Cl. 73-118.000.
Liu, Ping Y., 4,539,358, Cl. 524-285.000.
McLoughlin, Joseph R., 4,539,022, Cl. 55-114.000.
Mears, David F.; and Patterson, Hubert A., 4,539,706, Cl. 455-11.000.
O'Malley, William J.; and Vaughn, Howard A., Jr., 4,539,351, Cl. 524-43.000.
Varshneya, Arun K., 4,539,509, Cl. 313-623.000.

General Foods Corporation: *See*—
Schweid, Jeffrey M.; Cohee, Arthur H.; and Dec, Anthony F., 4,539,215, Cl. 426-589.000.

General Kinetics, Inc.: *See*—
Hill, James D., 4,539,619, Cl. 361-151.000.

General Motors Corporation: *See*—
Taylor, Edward F., 4,538,851, Cl. 296-1.00S.

Genoa Group Inc.: *See*—
Shea, Gregory T.; and Ballantyne, Ernest R., 4,538,653, Cl. 141-285.000.

Geo-Centers, Inc.: *See*—
Tran, Danh C.; and Fisher, Chester, 4,539,032, Cl. 65-32.000.

Geo-Systems, Inc.: *See*—
Partin, James R.; and Rawlings, John P., 4,538,673, Cl. 165-45.000.

Geo Vann, Inc.: *See*—
Brieger, Emmet F.; George, Flint R.; and Colle, Edward A., Jr., 4,538,680, Cl. 166-55.000.

George, Flint R.: *See*—
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Delahoussaye, Ronald D.; and Brazell, James W., II, 4,538,825, Cl. 280-242.0WC.

Gerber, Christoph E.: *See*—
Binnig, Gerd K.; Gerber, Christoph E.; Rohrer, Heinrich; and Weibel, Edmund, 4,539,089, Cl. 204-192.00R.

Gerber, Hans-Adolf: *See*—
Kramler, Josef; Kuhn-Kuhnenfeld, Franz; and Gerber, Hans-Adolf, 4,539,050, Cl. 148-1.500.

Gerber, Richard: *See*—
Ehrmann, Karl; and Gerber, Richard, 4,538,564, Cl. 123-146.50A.

Getty Oil Company: *See*—
Friedman, Robert H.; and Eakin, Bertram E., 4,539,093, Cl. 208-8.0LE.

Giacopelli, James N.; McElroy, James D.; and Taylor, Thomas M., to AT&T Bell Laboratories. Stored program power control system for improving energy efficiency for telephone sets connected into a local telephone communications system. 4,539,437, Cl. 179-18.0ES.

Gibbons, James F.: *See*—
Moddel, Garret R.; and Gibbons, James F., 4,539,431, Cl. 136-258.000.

Gibbs, Michael A.: *See*—
O'Connell, Peter; and Gibbs, Michael A., 4,539,210, Cl. 426-56.000.

Gibson, Rodney W.: *See*—
Stein, Paul J.; and Gibson, Rodney W., 4,539,646, Cl. 364-484.000.

Gigandet, Richard W., to Lincoln Manufacturing Company, Inc. Oven control circuitry cooling system for a double-stack food preparation oven arrangement. 4,539,469, Cl. 219-412.000.

Gill, Gerald G.; and Rhodes, Donald G. Therapeutic traction device. 4,538,598, Cl. 128-75.000.

Gill, Michael L., to Beloit Corporation. Disk screen apparatus, disk assemblies and method. 4,538,734, Cl. 209-668.000.

Girardeau, Yvette: *See*—
Gagne, Pierre; Girardeau, Yvette; and Pointud, Bernard, 4,539,366, Cl. 524-507.000.

Giulini Chemie GmbH: *See*—
Schanz, Klaus; Schwind, Albert; Grund, Hartmut; and Klehr, Peter, 4,539,195, Cl. 423-419.00P.

GKN Technology Limited: *See*—
Edwards, Michael F.; Barlow, John; Foreman, Frederick A.; and Williams, Gwynne, 4,538,860, Cl. 305-56.000.

GKSS-Forschungszentrum Geesthacht GmbH: *See*—
Michaelis, Walfried; Fanger, Hans-Ulrich; and The, Hans L., 4,539,649, Cl. 364-558.000.

Glamorise Foundations Inc.: *See*—
Pundyk, Bernard, 4,538,615, Cl. 128-555.000.

Glass, Max: *See*—
Kampfer, Helmut; Hase, Marie; and Glass, Max, 4,539,408, Cl. 546-139.000.

Gleason, Robert F.: *See*—
Anctil, Stephen N.; Gleason, Robert F.; Hadfield, Don A.; Logan, John S. B., Jr.; and Richardson, Alfred G., 4,538,881, Cl. 350-96.230.

Glover, Loren J.; Flower, Milton O.; and Pinassi, David J., to Max Factor & Co. Compact having a removable godet. 4,538,725, Cl. 206-37.000.

Glyco Antriebstechnik GmbH: *See*—
Stich, Bodo; Hassler, Ernst; and Adamowicz, Slawomir, 4,538,974, Cl. 418-26.000.

GMT Gesellschaft fur medizinische Technik mbH: *See*—
Engelbrecht, Eckart; Nieder, Elmar; and Keller, Arnold, 4,538,305, Cl. 623-20.000.

Gneiss, Heinz; and Wunsch, Werner, to Robert Bosch GmbH. Method and apparatus for preventing damage by overheating to an air flow rate meter resistor. 4,538,456, Cl. 73-204.000.

Gneiss, Heinz; and Sumal, Jaihind S., to Robert Bosch GmbH. Apparatus for measuring the mass of a flowing medium. 4,538,457, Cl. 73-204.000.

Gobbels, Heinz-Dieter: *See*—
Baltsch, Erwin; Gobbels, Heinz-Dieter; Grecksch, Hans; Lassmann, Manfred; Raasch, Hans; and Schlosser, Helmut, 4,538,408, Cl. 57-263.000.

Godecke, Paul; and Meichel, Otto, to Krones Ag Hermann Kronseder Maschinenfabrik. Apparatus for machining a polygon profile on a workpiece. 4,538,945, Cl. 409-157.000.

Goebel, Franz, to GTE Government Systems Corporation. Electrochemical cell having a plurality of battery stacks. 4,539,272, Cl. 429-94.000.

Goebel, Franz, to GTE Government Systems Corporation. Electrode structure for electrochemical cell. 4,539,273, Cl. 429-94.000.

Goebel, Franz, to GTE Government Systems Corporation. Electrochemical cell having wound electrode structures. 4,539,274, Cl. 429-94.000.

Goedecke, Wolf-Dieter; Schneckenburger, Gerhard; and Schwenzer, Reinhard, to Kienzle Apparate GmbH. Electropneumatic pilot control stage for a pneumatic servo valve. 4,538,643, Cl. 137-625.640.

Goel, Anil B.; and Richards, Harvey J., to Ashland Oil, Inc. Cross-linking of maleic anhydride polymers with bicyclic amide acetals. 4,539,376, Cl. 525-375.000.

Gohl, Walter: *See—*
Esper, Friedrich; Friese, Karl-Hermann; Gohl, Walter; and Sternad, Peter, 4,539,503, Cl. 313-11.500.

Goldfarb, Adolph E. Working musical carousel kit with rocking figures. 4,538,803, Cl. 272-31.00R.

Goldschmidt, Rainer: *See—*
Eggert, Albert; and Goldschmidt, Rainer, 4,539,441, Cl. 179-111.00E.

Goldstein, Sidney E., to Boeing Company, The. Caster type empennage assembly for aircraft. 4,538,779, Cl. 244-87.000.

Golovkin, Viktor T.: *See—*
Nosal, Vsevolod V.; Rybakov, Jury V.; Golovkin, Viktor T.; Novokreschenov, Mikhail M.; Lysikov, Boris V.; and Staneshin, Anatoly V., 4,538,350, Cl. 29-825.000.

Gomann, Rolf: *See—*
Grasse, Hans-Jochen; and Gomann, Rolf, 4,538,629, Cl. 131-282.000.

Gombert, Jean-Marie, to Airwick AG. Device ensuring permanent nutrition of pot plants. 4,539,038, Cl. 71-64.110.

Gonda, Michihiro: *See—*
Kaneko, Kazuo; Gonda, Michihiro; Suzuka, Susumu; and Kitsukawa, Katsumasa, 4,539,577, Cl. 346-207.000.

Goode, Steven H., to Motorola, Inc. Method and coherent demodulators for MSK signal. 4,539,524, Cl. 329-50.000.

Gooden, Richmond A., to United Aircraft Products, Inc. Bootstrap reservoir. 4,538,972, Cl. 417-540.000.

Gooding, Robert J., to Action Concepts, Inc. Portable tool for affixing terminals onto battery cables. 4,538,443, Cl. 72-416.000.

Goodman, Michael G.; and Weigle, William O., to Scripps Clinic and Research Foundation. Modulation of animal cellular responses with compositions containing 8-substituted guanine derivatives. 4,539,205, Cl. 514-45.000.

Goodyear Tire & Rubber Company, The: *See—*
Ambler, Michael R.; Lattime, Richard R.; and Wanca, Edward, 4,539,346, Cl. 523-332.000.
Nixon, Bryan E.; Ward, Donald W.; and Zaucha, Ronald J., 4,539,169, Cl. 264-171.000.

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Delaney, Norma G.; and Gordon, Eric M., 4,539,312, Cl. 514-16.000.

Gordon, Eugene I.; and Levy, Uri, to AT&T Bell Laboratories. Semiconductor laser CRT. 4,539,687, Cl. 372-43.000.

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Schick, Jean-Francois, 4,538,755, Cl. 227-152.000.

Goto, Yasuhiro: *See—*
Deguchi, Masahiro; Moriya, Mitsuro; Wakami, Noboru; Goto, Yasuhiro; and Shiragami, Kazuharu, 4,539,664, Cl. 369-44.000.

Gottfried Bischoff Bau Kompl. Gasreinigunga- und Wasserruckkuhlanlagen GmbH: *See—*
Stehning, Werner, 4,539,184, Cl. 422-170.000.

Gottfried Bischoff Bau kompl. Gasreinigungs -und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft: *See—*
Stehning, Werner; and Nusser, Horst D., 4,539,024, Cl. 55-223.000.

Gradl, Reinhard: *See—*
Schimmel, Gunther; Gradl, Reinhard; and Heymer, Gero, 4,539,192, Cl. 423-321.00R.

Grafelmann, Hans L. Bone implant. 4,538,304, Cl. 623-16.000.

Graham, Marshall D.; Cook, Dudley D., Jr.; Gecks, Donald L.; and Shaw, Robert, to Coulter Electronics, Inc. Optical microscope system. 4,538,885, Cl. 350-529.000.

Gramlich, Walter: *See—*
Degner, Dieter; Hannebaum, Heinz; Siegel, Hardo; and Gramlich, Walter, 4,539,081, Cl. 204-78.000.

Grand, Paul S.: *See—*
Ramachandran, Pallassana; and Grand, Paul S., 4,539,135, Cl. 252-174.110.

GRAPHA-Holding AG: *See—*
Boss, Heinz, 4,538,397, Cl. 53-430.000.

Grasse, Hans-Jochen; and Gomann, Rolf, to Hauni-Werke Korber & Co. KG. Method and apparatus for the production and manipulation of plain cigarettes and the like. 4,538,629, Cl. 131-282.000.

Graves, Delbert E.; and Craft, George E., to Newell Companies, Inc. Window shade, and method apparatus for manufacturing same. 4,539,239, Cl. 428-43.000.

Gray, Edmund, to Standard Telephones and Cables, Public Limited Company. Ceramic capacitor. 4,539,620, Cl. 361-275.000.

Gray, Matthew H.; and Everett, Robert D., to Hilgraeve, Incorporated. Electronic coin acceptor. 4,538,719, Cl. 194-100.00A.

Grecksch, Hans: *See—*
Baltsch, Erwin; Gobbels, Heinz-Dieter; Grecksch, Hans; Lassmann, Manfred; Raasch, Hans; and Schlosser, Helmut, 4,538,408, Cl. 57-263.000.

Green, Michael J., to BP Chemicals Limited. Process for the preparation of formamides. 4,539,427, Cl. 564-132.000.

Greenblatt, Gordon M. Blood infusion apparatus and method. 4,539,005, Cl. 604-141.000.

Gresens, Harry, to Bruckner Trockentechnik GmbH & Co. KG. Apparatus for the treatment of continuously transported lengths of textile material with circulating air, especially a tentering frame dryer. 4,538,361, Cl. 34-82.000.

Griego, Deborah B.; Hopping, Joe M.; Rehage, Teddy A.; and Rhodes, John H., Jr., to International Business Machines Corporation. Electronic image registration. 4,538,905, Cl. 355-14.0SH.

Griffin, Thomas D.; and Kopala, Peter S. Mass calculating and indicating means for weighing moving vehicles. 4,539,650, Cl. 364-567.000.

Griffith, Edwin D., to Automated Container Corporation. Composite container. 4,538,758, Cl. 229-4.500.

Grigoriev, Nikita. Convertible furniture. 4,538,308, Cl. 5-37.00C.

Grim, Claude: *See—*
Boden, Richard M.; and Grim, Claude, 4,539,143, Cl. 252-522.00R.

Grooten, Hubertus M. J.: *See—*
Kleintjens, Ludovicus A. L.; and Grooten, Hubertus M. J., 4,539,425, Cl. 562-412.000.

Grosbois, Jean: *See—*
Bachot, Jean; and Grosbois, Jean, 4,539,085, Cl. 204-98.000.

Grossa, Mario; Tigler, Dieter H.; and Weinert, Hubert, to Du Pont de Nemours, E. I., and Company. Process for improving the printing quality of photohardenable reproduction materials. 4,539,287, Cl. 430-300.000.

Grossmann, Max; and Helwerth, Rainer, to Hoechst Aktiengesellschaft. Water-soluble lubricant. 4,539,128, Cl. 252-49.300.

Grow, Harlow B. Internal combustion heat engine. 4,538,567, Cl. 123-305.000.

Gruber, Hermann: *See—*
Puls, Bernhard; Gruber, Hermann; Leipold, Kurt; Schonberger, Richard; Kizak, Ulrich; and Huttereer, Max, 4,539,442, Cl. 179-115.5VC.

Gruber, Robert J.: *See—*
Barbetta, Angello J.; Gruber, Robert J.; Isganitis, Louis V.; Law, Kock-Yee; Lin, John W.; Koch, Ronald J.; and Dunn, Steven T., 4,539,284, Cl. 430-110.000.

Grund, Hartmut: *See—*
Schanz, Klaus; Schwind, Albert; Grund, Hartmut; and Klehr, Peter, 4,539,195, Cl. 423-419.00P.

Gruner, Hans; Pfeiffer, Arnold; Rommerswinkel, Heinrich-Wilhelm; and Vest, Rolf, to Mannesmann AG. Preventing an increase of the nitrogen content in molten steel. 4,539,042, Cl. 75-43.000.

Grzelka, Andrew; and Hodges, Davis R., to Litton Systems, Inc. Adjustable locking chock system. 4,538,938, Cl. 405-198.000.

GTE Automatic Electric Incorporated: *See—*
Abrant, Robert J., 4,539,656, Cl. 364-900.000.
Jarocinski, Richard; Keaton, William R.; and Magennis, Joseph L., 4,539,070, Cl. 156-659.100.

GTE Government Systems Corporation: *See—*
Goebel, Franz, 4,539,272, Cl. 429-94.000.
Goebel, Franz, 4,539,273, Cl. 429-94.000.
Goebel, Franz, 4,539,274, Cl. 429-94.000.

GTE Laboratories Incorporated: *See—*
Palilla, Frank C.; MacAllister, Burton W., Jr.; and Salemi, Caster, 4,538,347, Cl. 29-619.000.
Riseberg, Leslie A., 4,539,505, Cl. 313-315.000.

GTE Products Corporation: *See—*
Bouchard, Andre, 4,539,510, Cl. 313-493.000.
Eby, John E.; and Kingston, Charles M., 4,539,587, Cl. 358-107.000.
Marshall, Robert J.; and Le, Thu T., 4,539,504, Cl. 313-113.000.

GTY Industries: *See—*
Poppenheimer, Charles B., 4,539,629, Cl. 362-267.000.

Guglielmetti, Leonardo, to Ciba-Geigy Corporation. Amine oxide compounds. 4,539,161, Cl. 260-465.00E.

Guhne, Wieland: *See—*
Ahlf, Heinz-Jurgen; Guhne, Wieland; Wulf, Peter; and Simm, Hans-Peter, 4,538,322, Cl. 15-387.000.

Guidicianne, Sidney J.: *See—*
Mugford, David B.; and Guidicianne, Sidney J., 4,538,812, Cl. 273-73.00R.

Gunderman, Glen L.: *See—*
Mani, Inder; and Gunderman, Glen L., 4,539,373, Cl. 525-203.000.

Gunesin, Binnur Z., to Mobil Oil Corporation. High impact poly(p-methylstyrene) polymers. 4,539,371, Cl. 525-98.000.

Gunn, Robert C. Means for mounting chuck lever pins in a fulcrum device. 4,538,823, Cl. 279-37.000.

Gunter, Rebecca C., to Portable Technology, Inc. Portable playpen. 4,538,309, Cl. 5-99.00B.

Gustafson, Inc.: *See—*
Skarpness, Harold, 4,538,472, Cl. 73-863.550.

Guth, Christian: *See—*
Abel, Heinz; and Guth, Christian, 4,539,353, Cl. 524-123.000.

Gwin, Robert M. Medicament and method for inducing immunity to infectious bovine keratoconjunctivitis. 4,539,201, Cl. 424-92.000.

H. Weidmann AG.: *See—*
Isler, Erwin, 4,538,940, Cl. 405-259.000.

Hachiro, Nobuaki, to Nissin Kogyo Kabushiki Kaisha. Vacuum booster diaphragm mounting. 4,538,503, Cl. 91-376.00R.

Hacias, Kenneth J., to Parker Chemical Company. Process for producing phosphate coatings. 4,539,051, Cl. 148-6.15Z.

Hackler, Erich: *See—*
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, 4,539,016, Cl. 48-197.00R.

Hadfield, Don A.: *See—*
Anctil, Stephen N.; Gleason, Robert F.; Hadfield, Don A.; Logan, John S. B., Jr.; and Richardson, Alfred G., 4,538,881, Cl. 350-96.230.

Hagemann, Alfred: *See—*
Cue, Robert; and Hagemann, Alfred, 4,539,063, Cl. 156-361.000.

Hager, Thomas P.; and Ferguson, Larry W., to Owens-Corning Fiberglas Corporation. Gas filtering method using fabric filter. 4,539,021, Cl. 55-97.000.

Haglund, Kjell. Reversing means in water-jet propulsion units. 4,538,997, Cl. 440-41.000.

Hahn & Clay: *See—*
Pechacek, Raymond E., 4,538,798, Cl. 269-289.00R.

Hahn, Helmuth; Cordt, Werner; and Borm, Winfried, to Siemens Aktiengesellschaft. Method and apparatus for checking analog-to-digital converters, digital-to-analog converters, or telecommunications transmission links which contain such converters. 4,539,683, Cl. 371-15.000.

Hajianpour, Muhamad A. Passive exercising device. 4,538,595, Cl. 128-25.00R.

Hakansson, Nils O., to AB Volvo. Device for measuring the load on a turbo-charged diesel engine, especially for regulating the injection timing in dependence thereon. 4,538,581, Cl. 123-502.000.

Halkes, Sebastianus J.: *See—*
Vandewalle, Maurits; Vanmaele, Luc J.; De Clercq, Pierre J.; Halkes, Sebastianus J.; and Overbeek, Wilhelmus R. M., 4,539,153, Cl. 260-397.200.

Hall, Charles P.; Philipson, Joseph; and Johenning, John B., to Monterey Manufacturing Co. Self-sealing puncturable article. 4,538,311, Cl. 5-451.000.

Hall, Sherman E. Low thrust detection system for aircraft engines. 4,538,777, Cl. 244-1.00R.

Hall, William G.; and Boswell, Peter G., to Johnson Matthey PLC. Electrical connector. 4,538,876, Cl. 339-118.00R.

Haller, Kurt H.; and Kidaloski, Raymond G., to Babcock & Wilcox Company, The. Casing seal attachment. 4,538,550, Cl. 122-235.00G.

Hallgren, John E., to General Electric Company. Method for making silicone-polyester copolymers. 4,539,379, Cl. 525-446.000.

Halliburton Company: *See—*
Martin, Larry D.; and Brown, Paul S., 4,539,134, Cl. 252-156.000.
Son, Adelina J.; and Kuzlik, Mark S., 4,539,122, Cl. 252-8.55R.

Hallmark, Richard K.; Skowronski, Michael J.; and Stephens, William D., to Jim Walter Resources, Inc. Digestion products of polyalkylene terephthalate polymers and polycarboxylic acid-containing polyols and polymeric foams obtained therefrom. 4,539,341, Cl. 521-172.000.

Halvorsen, Gunnar, to Elkem a/s. Method for production of pure silicon. 4,539,194, Cl. 423-348.000.

Hamada, Hideo: *See—*
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,539,643, Cl. 364-431.090.

Hamar, Edward K.; and Blakeman, Gordon E., to Horner Flooring Company. Portable sectional flooring system. 4,538,392, Cl. 52-582.000.

Hanke, Hans: *See—*
Kurz, Wolf-Dieter; Hanke, Hans; and Braatz, Andreas, 4,538,553, Cl. 123-41.130.

Hanmyo, Masayuki: *See—*
Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Hasegawa, Teruyuki; Nimura, Yoichi; and Hiraga, Noriyuki, 4,539,043, Cl. 266-265.000.

Hanna, Kenneth V. Convertible bed and pack frame. 4,538,750, Cl. 224-156.000.

Hannebaum, Heinz: *See—*
Degner, Dieter; Hannebaum, Heinz; Siegel, Hardo; and Gramlich, Walter, 4,539,081, Cl. 204-78.000.

Hanneken, Henry P., to PPG Industries, Inc. Melting of glass with staged submerged combustion. 4,539,034, Cl. 65-134.000.

Hansen, Dennis D., to Minnesota Mining and Manufacturing Company. Moisture-curable polyurethane composition. 4,539,345, Cl. 523-219.000.

Hansen, Flemming A.: *See—*
Henrichsen, Frank; Hansen, Flemming A.; and Sorensen, Kim, 4,538,988, Cl. 433-84.000.

Hansen, John C.; and Johnson, Lloyd A., to Borg-Warner Corporation. Programmable maintenance timer system. 4,539,632, Cl. 364-143.000.

Hanyu, Susumu; and Yamaguchi, Yoshio, to Janome Sewing Machine Industry Co., Ltd. Sewing machine with upper thread dyeing mechanism. 4,538,535, Cl. 112-270.000.

Hanzawa, Koutarou, to Casio Computer Co., Ltd. Electronic musical instrument. 4,538,496, Cl. 84-1.260.

Hara, Senri; Tomono, Hiroshi; Kimura, Tomohiko; Inoue, Kunio; Sato, Takayuki; and Okada, Yoshio, to Sumitomo Metal Industries, Ltd.; and Satosen Co., Ltd. Molds for continuously casting steel. 4,538,667, Cl. 164-418.000.

Harada, Yoshihito: *See—*
Sakai, Shinji; Harada, Yoshihito; Ishizaki, Akira; and Kawabata, Takashi, 4,538,892, Cl. 354-402.000.

Harbach, Friedrich, to Brown, Boveri & Cie AG. Solid electrolyte. 4,539,276, Cl. 429-191.000.

Harben, Grover S., Jr.; Ellis, James S.; and Emmett, Joe M., to Centennial Machine Company, Inc. Gizzard harvesting machine. 4,538,325, Cl. 17-45.000.

Harbridge, John B.: *See—*
Clarke, Brian P.; Harbridge, John B.; and Stirling, Irene, 4,539,202, Cl. 424-114.000.

Hardison, John C. Liquid aerator. 4,539,110, Cl. 210-150.000.

Hardy, Raymond D.; and Van Steenwyk, William E. Power torque wrench tool. 4,538,484, Cl. 81-57.140.

Hare, James W., to Du Pont de Nemours, E. I., and Company. Process for steam-conditioning spin-oriented polyamide filaments. 4,539,170, Cl. 264-176.00F.

Harger, Mark A., to RCA Corporation. Tuning control system for a pair of tuners employing a common channel skip memory. 4,539,711, Cl. 455-166.000.

Harms, Engelbert G., to Uniroyal Englebert Reifen GmbH. Screw extruder. 4,538,917, Cl. 366-75.000.

Harnischfeger Corporation: *See—*
Luebke, Roger D., 4,538,954, Cl. 414-633.000.

Harris, Alfred W., to Boeing Company, The. Preloaded latch. 4,538,843, Cl. 292-113.000.

Harris Graphics Corporation: *See—*
Wise, James C., 4,538,511, Cl. 100-7.000.

Harrison, Brian; and Diwell, Alan F., to Johnson Matthey Public Limited Company. Process for making a lead-tolerant catalyst system for purifying exhaust. 4,539,311, Cl. 502-304.000.

Harrison, Bruce R.: *See—*
Galbreath, Ronald E.; and Harrison, Bruce R., 4,539,701, Cl. 382-1.000.

Harry, Ieuan L.: *See—*
Piccioli, David P.; Harry, Ieuan L.; and Clark, Richard E., 4,539,463, Cl. 219-121.0LG.

Harsco Corporation: *See—*
Johnson, Bruce S.; and Borst, Paul H., 4,538,723, Cl. 206-3.000.
Johnson, Bruce S., 4,538,724, Cl. 206-3.000.

Hart, Richard A.; and Bartkowski, Charles, to United Technologies Corporation. Passively Q-switched laser having a variable pulse rate. 4,539,685, Cl. 372-25.000.

Hartner, Hartmut: *See—*
Merrem, Hans-Joachim; Neisius, Karlheinz; Klug, Rudolf; and Hartner, Hartmut, 4,539,288, Cl. 430-325.000.

Hartog, Jan J.; Bellin, Jack L.; Knollman, Gilbert C.; and Jonath, Arthur D., to Lockheed Corporation. Adhesive bond integrity evaluation method. 4,538,462, Cl. 73-577.000.

Hase, Marie: *See—*
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Hasegawa, Nobuo: *See—*
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Hasegawa, Teruyuki: *See—*
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Hasegawa, Yoji: *See—*
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Hasegawa, Yutaka: *See—*
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Hashimoto, Akio; and Yasuda, Tomio, to Aisin Seiki Kabushiki Kaisha. Motor-driven power steering system. 4,538,698, Cl. 180-79.100.

Hashimoto, Masashi; Aratani, Matsuhiko; and Sawada, Kozo, to Fujisawa Pharmaceutical Co., Ltd. 4-Substituted-2-oxoazetidine compounds. 4,539,152, Cl. 260-245.20T.

Hashimoto, Masashi: *See—*
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,539,155, Cl. 260-112.50R.

Hashimoto, Yasuhiko: *See—*
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Hashimoto, Yasuo: *See—*
Ishino, Ken; Hashimoto, Yasuo; and Narumiya, Yoshikazu, 4,539,433, Cl. 174-35.0MS.

Hassler, Ernst: *See—*
Stich, Bodo; Hassler, Ernst; and Adamowicz, Slawomir, 4,538,974, Cl. 418-26.000.

Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, to Pioneer Electronic Corporation. Method and system for optically recording and playing back information on a recording medium having magnetization film thereon. 4,539,662, Cl. 369-13.000.

Hatfield, John G.; and Volinskie, Robert, to AMP Incorporated. Method and apparatus for stripping shielded flat cable. 4,538,487, Cl. 81-9.510.

Hatt, Brian W.: *See—*
Butcher, Anthony V.; and Hatt, Brian W., 4,539,124, Cl. 252-28.000.

Hattori, Yoshiyuki: *See—*
Takei, Toshihiro; Hattori, Yoshiyuki; and Ohnishi, Shunsaku, 4,538,958, Cl. 415-53.00T.

Hauni-Werke Korber & Co. KG: *See—*
Grasse, Hans-Jochen; and Gomann, Rolf, 4,538,629, Cl. 131-282.000.
Hinzmann, Alfred, 4,538,626, Cl. 131-84.400.
Koch, Franz P., 4,538,450, Cl. 73-38.000.

Hawlitzki, Christian; and Dick, Heinz, to Ford Motor Company. Indicator lamp and headlamp mounting to vehicle bodyworks. 4,539,626, Cl. 362-66.000.

Hayakawa, Isao; and Tanaka, Yoshiaki, to Daiichi Seiyaku Co., Ltd. Pyridobenzoxazine derivatives useful as antibacterial agents. 4,539,401, Cl. 544-101.000.

Hayakawa, Masazumi: *See—*
Sakai, Takayoshi; Mizoguchi, Kiyohisa; and Hayakawa, Masazumi, 4,539,634, Cl. 364-167.000.

Hayashi, Hideki; Takagi, Satoshi; Ito, Yukio; and Endo, Sadayoshi, to Clarion Co., Ltd. Tape recorder. 4,538,753, Cl. 226-199.000.

Hayashi, Hidetaka: *See—*
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Hayashi, Shigeki: *See—*
Sakuraya, Toshikazu; Fujii, Tetsuya; Matsui, Shigeo; and Hayashi, Shigeki, 4,539,020, Cl. 55-26.000.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Arrangement of boiling liquid cooling system of internal combustion engine. 4,538,554, Cl. 123-41.210.
Hayden Nilos Conflow Limited: *See—*
Perry, Dennis A.; and Wilmot, David H., 4,538,763, Cl. 239-600.000.
Heath Company: *See—*
Krenz, Horst M., 4,538,875, Cl. 339-103.00R.
Heath, Derek E.: *See—*
Apairo, Jerry, Jr.; and Heath, Derek E., 4,538,989, Cl. 433-102.000.
Heeres, Jan, to Janssen Pharmaceutica N.V. 1-(2-Aryl-2-halo-1-ethenyl)-1H-azoles, and anticonvulsant use thereof. 4,539,325, Cl. 514-283.000.
Heeson, Iona E.: *See—*
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Hefner, Robert E., Jr., to Dow Chemical Company, The. Alkenylphenylglycidyl ether capped hydroxystyryl pyridines (pyrazines) and polymers thereof. 4,539,377, Cl. 525-401.000.
Heiba, El-Ahmadi I.; and Williams, Albert L., to Mobil Oil Corporation. Hydroxyamide acid products and butyrolactone and butyrolactam products. 4,539,127, Cl. 252-47.500.
Heilos, Johannes: *See—*
Arntz, Dietrich; Prescher, Gunter; Burkhardt, Werner; Heilos, Johannes; and Manner, Reinhard, 4,539,409, Cl. 546-286.000.
Heimark, Charles J., Jr.; and Heimark, Charles J., Sr., to General Dryer Corporation. Adjustable crop divider apparatus. 4,538,404, Cl. 56-314.000.
Heimark, Charles J., Sr.: *See—*
Heimark, Charles J., Jr.; and Heimark, Charles J., Sr., 4,538,404, Cl. 56-314.000.
Heinbockel, Wolfgang: *See—*
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Heine, Helmut A.; Rosenbusch, Helmut W.; and Schmidt, Otto H., to Heine Optotechnik GmbH & Co.; and Propper Manufacturing Co., Inc. Manual ophthalmoscope. 4,538,889, Cl. 351-205.000.
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Heine, Helmut A.; Rosenbusch, Helmut W.; and Schmidt, Otto H., 4,538,889, Cl. 351-205.000.
Heinen, Hans-Dieter, to Intellectual Trade CY S.A. Fire-break. 4,538,389, Cl. 52-221.000.
Heinzl, Alfred: *See—*
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Helwerth, Rainer: *See—*
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Hembree, Thomas D.: *See—*
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Henderson, Elizabeth. Athletic garment. 4,538,614, Cl. 128-494.000.
Henderson, Gordon W. Microwave heated hair curler. 4,538,630, Cl. 132-33.00R.
Henderson, Pieter M.; and Schmitt, Karl-Heinz. Application of surfacing sheets to panels, columns and the like. 4,539,066, Cl. 156-479.000.
Hendrickson, Larry L.: *See—*
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Henkel Kommanditgesellschaft auf Aktien: *See—*
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Meyer, Dieter; Rossmann, Christian; and Zetzsche, Friedbert, 4,539,117, Cl. 210-639.000.
Henneuse, Donald P., to Magnuson Corporation. Centering device for a food slicer. 4,538,491, Cl. 83-402.000.
Henrichsen, Frank; Hansen, Flemming A.; and Sorensen, Kim. Dental apparatus with a number of dental instruments connected to a common control circuit and a common operator unit. 4,538,988, Cl. 433-84.000.
Henry, Nelson R.; Cutler, Duncan B.; and Warner, William L., to Kliklok Corporation. Method and apparatus for combination weighing with multiple storage cups for each scale hopper. 4,538,692, Cl. 177-1.000.
Henry, Susanne G.; Tsunemura, Kazuo; and Iha, Kiyoshi, to Chamberlain Manufacturing Corporation. Garage door operator and method of assembling. 4,538,661, Cl. 160-35.000.
Hepburn, George R., to Dynasplint Systems, Inc. Adjustable splint. 4,538,600, Cl. 128-88.000.
Hering, Bernhard: *See—*
Schweiger, Josef; and Hering, Bernhard, 4,539,539, Cl. 335-78.000.
Herman, Jan S.; Morrison, Peter A.; and Richards, Gerald P., to United States of America, Army. Method and apparatus for signaling on-line failure detection. 4,539,682, Cl. 371-15.000.
Herrmann, Bodo; Bastel, Paul; and Bas, Selahattin, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of hardfacing vertical walls. 4,539,460, Cl. 219-73.210.
Herrmann, Klaus: *See—*
Jochemczyk, Claus; Kwiatkowski, Joachim; and Herrmann, Klaus, 4,538,927, Cl. 374-163.000.
Heuschen, Jean M. H.: *See—*
Abeelen, Petrus C. A. M. V.; Bussink, Jan; and Heuschen, Jean M. H., 4,539,350; Cl. 523-527.000.
Heymer, Gero: *See—*
Schimmel, Gunther; Gradl, Reinhard; and Heymer, Gero, 4,539,192, Cl. 423-321.00R.
Heynacher, Erich; and Ludewig, Reinhard, to Carl-Zeiss-Stiftung. Three-dimensional interferometric length-measuring apparatus. 4,538,911, Cl. 356-358.000.
Heynisch, Hinrich; and Schmid, Eckart, to Siemens Aktiengesellschaft. Traveling-wave tube with periodic permanent-magnet focussing system. 4,539,512, Cl. 315-5.350.
Hicks, Bruce W.: *See—*
English, Donald C.; and Hicks, Bruce W., 4,538,545, Cl. 118-679.000.
Hidaka, Yoshiaki; and Shinagawa, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Lubricant passage system for internal combustion engines. 4,538,565, Cl. 123-196.00R.
Higashihara, Teruaki, to Sony Corporation. Recording and/or reproducing apparatus for a disk. 4,539,671, Cl. 369-213.000.
Higgins, Robert C.; Stanich, Mikel J.; and Wolfe, Larry L., to International Business Machines Corporation. Scanning optical system for use with a semiconductor laser generator. 4,538,895, Cl. 355-3.00R.
Hilgraeve, Incorporated: *See—*
Gray, Matthew H.; and Everett, Robert D., 4,538,719, Cl. 194-100.00A.
Hill, James D., to General Kinetics, Inc. High energy degausser. 4,539,619, Cl. 361-151.000.
Hill, John P.; and Touchton, James J., to Storage Technology Corporation. Low offset position demodular. 4,539,608, Cl. 360-77.000.
Hill-Rom Company, Inc.: *See—*
Fleck, David C.; Novak, Joseph H.; and Koerber, Clement J., Sr., 4,539,560, Cl. 340-573.000.
Hilton-Davis Chemical Co., The: *See—*
Schmidt, Paul J.; and Hung, William M., 4,539,579, Cl. 346-218.000.
Hines, James H., to Vending Components, Inc. Keg-tapping assembly. 4,538,746, Cl. 222-153.000.
Hino Jidosha Kogyo Kabushiki Kaisha: *See—*
Tsuruoka, Shingo, 4,538,566, Cl. 123-276.000.
Hinzmann, Alfred, to Hauni-Werke Korber & Co. KG. Apparatus for trimming a tobacco stream. 4,538,626, Cl. 131-84.400.
Hiraga, Noriyuki: *See—*
Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Hasegawa, Teruyuki; Nimura, Yoichi; and Hiraga, Noriyuki, 4,539,043, Cl. 266-265.000.
Hiramatsu, Takeo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Hydraulic control system in automatic transmission gear for 4 advance speeds. 4,538,482, Cl. 74-869.000.
Hirano, Yukihisa: *See—*
Imamura, Toshio; Kobayashi, Syouzo; and Hirano, Yukihisa, 4,538,559, Cl. 123-90.600.
Hirohashi, Kazutoshi: *See—*
Ishigaki, Yukinobu; and Hirohashi, Kazutoshi, 4,539,527, Cl. 330-149.000.
Hirose, Namio: *See—*
Tanaka, Shinichi; and Hirose, Namio, 4,538,882, Cl. 350-255.000.
Hirsch, Martin; Schnabel, Wolfram; Sauer, Harald; and Schmidt, Hans-Werner, to Metallgesellschaft Aktiengesellschaft. Process of afterburning and purifying process exhaust gases. 4,539,188, Cl. 423-210.000.
Hirschbuehler, Kevin R.; and Stern, Bruce A., to American Cyanamid Co. High impact strength fiber resin matrix composites. 4,539,253, Cl. 428-229.000.
Hitachi, Ltd.: *See—*
Arai, Takao; Yamazaki, Shigeru; Kanazawa, Yasunori; and Noguchi, Takaharu, 4,539,615, Cl. 360-121.000.
Hoshino, Takashi; Arai, Takao; and Nishimura, Keizo, 4,539,605, Cl. 360-32.000.
Iino, Toshiki; and Kamata, Kunio, 4,538,960, Cl. 415-104.000.
Iso, Yoshimi; Inoue, Shigeki; Noda, Tsutomu; and Ohashi, Shinichi, 4,539,665, Cl. 369-44.000.
Kawamoto, Yasuo, 4,538,421, Cl. 62-157.000.
Kawashimo, Norishige; and Nakajima, Joe, 4,539,641, Cl. 364-424.000.
Miyauchi, Katsuki; Kudo, Tetsuichi; Minato, Osamu; Masuhara, Toshiaki; and Uetani, Yoshio, 4,539,660, Cl. 365-229.000.
Nakamura, Kenichi, 4,538,349, Cl. 29-736.000.
Sako, Kazuaki; and Mori, Kenjiro, 4,539,563, Cl. 340-735.000.
Shimohigashi, Katsuhiro; Masuda, Hiroo; Ikuzaki, Kunihiko; and Kawamoto, Hiroshi, 4,539,658, Cl. 365-207.000.
Yuito, Isamu; Shiiki, Kazuo; Saiki, Atsushi; Homma, Yoshio; Kumasaka, Noriyuki; Shiroishi, Yoshihiro; and Kudo, Mitsuhiro, 4,539,616, Cl. 360-125.000.
Hitachi Maxell, Ltd.: *See—*
Miyauchi, Katsuki; Kudo, Tetsuichi; Minato, Osamu; Masuhara, Toshiaki; and Uetani, Yoshio, 4,539,660, Cl. 365-229.000.
Hitachi Powdered Metals Co., Ltd.: *See—*
Asaka, Kazuo; and Koyama, Takashi, 4,539,197, Cl. 419-6.000.

Hitachi Shipbuilding & Engineering Co., Ltd.: *See*—
Ohta, Michio; Kamei, Sakito; and Aoki, Kazumi, 4,538,481, Cl. 74-603.000.

Ho, Cecil C.: *See*—
Sharpe, Claude A.; and Ho, Cecil C., 4,539,566, Cl. 343-389.000.

Hodges, Davis R.: *See*—
Grzelka, Andrew; and Hodges, Davis R., 4,538,938, Cl. 405-198.000.

Hodogaya Chemical Co., Ltd.: *See*—
Kaneko, Kazuo; Gonda, Michihiro; Suzuka, Susumu; and Kitsukawa, Katsumasa, 4,539,577, Cl. 346-207.000.

Hoechst Aktiengesellschaft: *See*—
Grossmann, Max; and Helwerth, Rainer, 4,539,128, Cl. 252-49.300.
Rosch, Gunter; and Sauer, Gerhard, 4,539,007, Cl. 8-111.000.
Schimmel, Gunther; Gradl, Reinhard; and Heymer, Gero, 4,539,192, Cl. 423-321.00R.

Hoeffken, Russell W.; and Wiese, John M., to Snyder General Corporation. Method for manufacturing a furnace heat exchanger and plate assembly. 4,538,338, Cl. 29-509.000.

Hoefke, Wolfgang: *See*—
Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Gaida, Wolfram, 4,539,323, Cl. 514-260.000.

Hoffman, Michael A., to Becton, Dickinson and Company. Particle sorter with neutralized collection wells and method of using same. 4,538,733, Cl. 209-3.100.

Hoffmann-La Roche Inc.: *See*—
Broger, Emil A.; and Crameri, Yvo, 4,539,411, Cl. 548-402.000.
Krebs, Ernst P., 4,539,154, Cl. 260-410.90N.
LeMahieu, Ronald A., 4,539,419, Cl. 560-053.000.

Hofmeister, James P.: *See*—
Bartlett, Geoffrey M.; Hofmeister, James P.; and Pring, Edward J., 4,539,653, Cl. 364-900.000.

Hofstatter, Alfred F.: *See*—
Lichti, Wayne P.; and Hofstatter, Alfred F., 4,539,175, Cl. 419-49.000.

Hogeboom, John G.: *See*—
Thomas, Terence N.; and Hogeboom, John G., 4,539,531, Cl. 331-11.000.

Hoh, George L., to Du Pont de Nemours, E. I., and Company. Blends of ionomer with propylene copolymer and articles. 4,539,263, Cl. 428-500.000.

Hokanson, Gerard C.: *See*—
Brankiewicz, Alex J.; Bunge, Richard H.; French, James C.; Hokanson, Gerard C.; Hurley, Timothy R.; and Schaumberg, John P., 4,539,203, Cl. 424-117.000.

Holbrook, Richard L.; and Mayer, Dean L., to Babcock & Wilcox Company, The. Method of mechanically prestressing a tubular apparatus. 4,538,337, Cl. 29-445.000.

Holland, Hugh H. Device for training basketball players to shoot. 4,538,808, Cl. 273-1.50A.

Hollingsworth, Clinton A., to C-H Development and Sales, Inc. Hydraulic separating method and apparatus. 4,539,103, Cl. 209-158.000.

Hollingsworth, Michael W.: *See*—
de Ridder, Johannes J. M.; Hollingsworth, Michael W.; and Robb, Ian D., 4,539,144, Cl. 252-526.000.

Holy, Zdenek J.: *See*—
Rosenbaum, Stanley D.; and Holy, Zdenek J., 4,539,438, Cl. 179-18.0FA.

Holzel, Bernd. Swimming and life saving device. 4,538,998, Cl. 441-122.000.

Homma, Yoshio: *See*—
Yuito, Isamu; Shiiki, Kazuo; Saiki, Atsushi; Homma, Yoshio; Kumasaka, Noriyuki; Shiroishi, Yoshihiro; and Kudo, Mitsuhiro, 4,539,616, Cl. 360-125.000.

Homsy, Robert V.: *See*—
Starkston, Robert; Luce, Mark C.; and Homsy, Robert V., 4,539,189, Cl. 423-220.000.

Honda Giken Kogyo K.K.: *See*—
Ogishima, Tetsuo, 4,539,627, Cl. 362-72.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Furukawa, Yoshimi; and Sano, Shoichi, 4,538,824, Cl. 280-91.000.
Hidaka, Yoshiaki; and Shinagawa, Hiroshi, 4,538,565, Cl. 123-196.00R.
Kami, Yozo; Minakawa, Masaaki; and Kubo, Kenji, 4,538,831, Cl. 280-666.000.
Nomura, Toshio; Taguchi, Eiji; and Aoi, Tomio, 4,538,577, Cl. 123-452.000.
Takamizawa, Masae; Kan, Shigenobu; and Mukainakano, Masato, 4,538,401, Cl. 56-11.800.
Wasada, Yuichi, 4,538,713, Cl. 192-54.000.

Hondadenshigiken Co., Ltd.: *See*—
Takahata, Yoshiro, 4,539,474, Cl. 250-221.000.

Honegger, Werner; and Burgi, Hanspeter, to Ferag AG. Counter apparatus for counting flat products moved along a conveying path or the like. 4,539,470, Cl. 235-98.00B.

Honeywell Inc.: *See*—
Nelson, Lorne W., 4,538,420, Cl. 62-140.000.

Hong, Se J.; and Nair, Ravindra, to International Business Machines Corporation. Method and apparatus for determining minimum/maximum of multiple data words. 4,539,549, Cl. 340-146.200.

Hong, Won-Doon: *See*—
Cheng, Cheng-Yi; Lee, Shou-Yuan; Chen, Kwang-Ming; and Hong, Won-Doon, 4,539,380, Cl. 526-78.000.

Hoover Company, The: *See*—
Kuplas, Harbey, 4,539,026, Cl. 55-376.000.

Hoppie, Lyle O.: *See*—
Schutten, Herman P.; Hoppie, Lyle O.; Turner, David; and Chute, Richard, 4,538,642, Cl. 137-625.280.

Hopping, Joe M.: *See*—
Griego, Deborah B.; Hopping, Joe M.; Rehage, Teddy A.; and Rhodes, John H., Jr., 4,538,905, Cl. 355-14.0SH.

Horie, Shigeru: *See*—
Kiriyama, Tsutomu; Horie, Shigeru; Ichihashi, Tetsuo; and Oshida, Masahiro, 4,539,389, Cl. 528-272.000.

Horiishi, Nanao: *See*—
Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, 4,539,129, Cl. 252-62.630.

Horizon Technology, Inc.: *See*—
Poetker, John J.; and Poetker, Peter, 4,539,472, Cl. 235-488.000.

Horler, Hansulrich: *See*—
Ammann, Hansruedi; and Horler, Hansulrich, 4,538,969, Cl. 417-407.000.

Hormadaly, Jacob, to Du Pont de Nemours, E. I., and Company. Thick film resistor compositions. 4,539,223, Cl. 427-102.000.

Horner Flooring Company: *See*—
Hamar, Edward K.; and Blakeman, Gordon E., 4,538,392, Cl. 52-582.000.

Horowitz, Justin. Canoe caddy. 4,538,829, Cl. 280-641.000.

Horwitz, Robert P.: *See*—
Cantor, Frank J.; and Horwitz, Robert P., 4,538,959, Cl. 415-98.000.

Hoshino, Takashi; Arai, Takao; and Nishimura, Keizo, to Hitachi, Ltd. PCM Tape recording and reproducing apparatus having a dropout-immune data recording format. 4,539,605, Cl. 360-32.000.

Hosiden Electronics Co., Ltd.: *See*—
Ojima, Shin; Kamiuchi, Hideaki; and Mine, Keiji, 4,538,509, Cl. 99-348.000.

Hoskins, John T.; Zillig, Robert G.; and Zillig, Steven R., to Hoskins, John T.; and Zillig, Robert G. Fluid coupling assembly. 4,538,679, Cl. 165-178.000.

Hosono, Nagao: *See*—
Tajima, Hatsuo; Takahashi, Tohru; and Hosono, Nagao, 4,538,896, Cl. 355-3.00R.

Hottes, Ronald W., to Allied Products Corporation. Rotary mower having ground supported frames. 4,538,400, Cl. 56-11.800.

Houben, Jan P.; and Moolenaar, Antonie J., to Skil Nederland B.V. Commutator motor and improved brush construction for use in portable machine tools. 4,539,500, Cl. 310-230.000.

Hougen, Everett D. Annular cutter. 4,538,944, Cl. 408-206.000.

Houminer, Yoram: *See*—
Chan, W. Geoffrey; and Houminer, Yoram, 4,538,627, Cl. 131-276.000.

Howard, John R.: *See*—
Lammert, James E.; Nichols, Charles E.; and Howard, John R., 4,538,318, Cl. 15-171.000.

Howard, William J. Magazine loader and cartridge clip useful therewith. 4,538,371, Cl. 42-87.000.

Howe, Dennis G.: *See*—
Marchant, Alan B.; and Howe, Dennis G., 4,539,573, Cl. 346-137.000.

Hoyme, Clifford L. Positive opening damper for combustion appliance. 4,538,980, Cl. 431-20.000.

Hrvojic, Ivan, to Ontario Research Foundation. Bore-hole hydraulics simulator. 4,538,452, Cl. 73-61.400.

Huber, Johann; and Thanner, Otto. Method for grinding or cutting a workpiece. 4,538,384, Cl. 51-322.000.

Hubner Gummi-Und Kunstsoff GmbH: *See*—
Koch, Robert, 4,538,523, Cl. 105-20.000.

Hudson, James A., to Campbell Soup Company. Contacting means for guiding containers across weight platform. 4,538,694, Cl. 177-145.000.

Hudspeth, Thomas; Basil, Richard V., Jr.; and Keeling, Harmon H., to Hughes Aircraft Company. Square conductor coaxial coupler. 4,539,534, Cl. 333-115.000.

Hudspeth, Thomas; Rosen, Harold A.; and Steinberg, Fritz, to Hughes Aircraft Company. Ferrite modulator assembly for beacon tracking system. 4,539,681, Cl. 370-119.000.

Huffman, Walter K.: *See*—
Flick, Robert H.; and Huffman, Walter K., 4,539,538, Cl. 335-16.000.

Hughes Aircraft Company: *See*—
Hudspeth, Thomas; Basil, Richard V., Jr.; and Keeling, Harmon H., 4,539,534, Cl. 333-115.000.
Hudspeth, Thomas; Rosen, Harold A.; and Steinberg, Fritz, 4,539,681, Cl. 370-119.000.

Hughes, David P., Jr. Portable desk. 4,538,861, Cl. 312-244.000.

Hughes Tool Company—USA: *See*—
Whanger, James R.; and Staudenmayer, Ralph, 4,539,018, Cl. 51-295.000.

Huhtala, Martti E.: *See*—
Blomqvist, Seppo I.; Saarela, Markku T.; Huhtala, Martti E.; Niska, Raimo A.; and Vaittinen, Hannu A., 4,538,986, Cl. 432-236.000.

Hung, William M.: *See*—
Schmidt, Paul J.; and Hung, William M., 4,539,579, Cl. 346-218.000.

Hunter Douglas International N.V.: *See*—
Edixhoven, Gerardus H., 4,538,330, Cl. 29-24.500.

Hunter, John E., to Procter & Gamble Company, The. Sterilization and stabilization process for meat analog products. 4,539,212, Cl. 426-325.000.

Hunter, William R.: *See*—
Pollack, Gordon P.; Teng, Clarence; and Hunter, William R., 4,538,343, Cl. 29-576.00W.

Huntington National Bank, The: *See*—
Williams, Marvin E.; Chaney, David B.; and Rebele, Donald J., 4,538,709, Cl. 190-18.00A.
Hurley, Timothy R.: *See*—
Brankiewicz, Alex J.; Bunge, Richard H.; French, James C.; Hokanson, Gerard C.; Hurley, Timothy R.; and Schaumberg, John P., 4,539,203, Cl. 424-117.000.
Hurst, John, to W. R. Grace Limited. Insulating material. 4,539,262, Cl. 428-407.000.
Husky Oil Operations Ltd.: *See*—
Ronden, Clifford P., 4,539,100, Cl. 208-188.000.
Huther, Werner: *See*—
Betz, Wolfgang; and Huther, Werner, 4,539,231, Cl. 427-255.000.
Hutter, Herwig: *See*—
Ruprechter, Adam; and Hutter, Herwig, 4,538,761, Cl. 239-196.000.
Huttereer, Max: *See*—
Puls, Bernhard; Gruber, Hermann; Leipold, Kurt; Schonberger, Richard; Kizak, Ulrich; and Huttereer, Max, 4,539,442, Cl. 179-115.5VC.
Hwang, San-Bao: *See*—
Biftu, Tesfaye; Hwang, San-Bao; Doebber, Thomas W.; Beattie, Thomas R.; and Shen, Tsung-Ying, 4,539,332, Cl. 514-461.000.
Hydro Fuels, Inc.: *See*—
Russ, James J.; and Smith, John W., 4,539,187, Cl. 423-132.000.
Iafrate, Gerald J.: *See*—
Malik, Roger J.; and Iafrate, Gerald J., 4,539,581, Cl. 357-58.000.
Ichihashi, Tetsuo: *See*—
Kiriyama, Tsutomu; Horie, Shigeru; Ichihashi, Tetsuo; and Oshida, Masahiro, 4,539,389, Cl. 528-272.000.
Ichikawa, Yasunori; Yamaguchi, Shigeru; Kojima, Akira; and Fujiwara, Kazuhiko, to Fuji Photo Film Co., Ltd. Process for the preparation of oil-in-water emulsions. 4,539,139, Cl. 252-314.000.
Ichikawa, Yoshinori: *See*—
Shigemasa, Takashi; and Ichikawa, Yoshinori, 4,539,633, Cl. 364-162.000.
Ichimura, Yoshiaki, to Japan Aviation Electronics Industry. Contact element with locking means. 4,538,864, Cl. 339-17.0CF.
Idemitsu Kosan Company: *See*—
Sato, Mikio, 4,539,125, Cl. 252-32.70E.
IDN Inventions and Development of Novelties AG: *See*—
Ackeret, Peter, 4,538,729, Cl. 206-387.000.
Ife, Robert J.: *See*—
Brown, Thomas H.; and Ife, Robert J., 4,539,207, Cl. 514-272.000.
Igarashi, Akira; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Heat sensitive recording material. 4,539,578, Cl. 346-207.000.
Igarashi, Takashi; Mukai, Nakashiro; and Otsuki, Haruki, to Iseki & Co., Ltd. Speed-changing transmission device for vehicles. 4,538,475, Cl. 74-368.000.
Iguchi, Eiko: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,539,155, Cl. 260-112.50R.
Iha, Kiyoshi: *See*—
Henry, Susanne G.; Tsunemura, Kazuo; and Iha, Kiyoshi, 4,538,661, Cl. 160-35.000.
Iino, Toshiki; and Kamata, Kunio, to Hitachi, Ltd. Axial thrust balancing device for pumps. 4,538,960, Cl. 415-104.000.
Iizuka, Hajime: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; and Shirakawa, Isao, 4,539,150, Cl. 260-239.30B.
Katakami, Tsutomu; Fukazawa, Nobuyuki; and Iizuka, Hajime, 4,539,151, Cl. 260-239.30B.
Ikeda, Yasunari: *See*—
Tanaka, Yutaka; Ikeda, Yasunari; and Nakano, Hiroshi, 4,539,592, Cl. 358-140.000.
Ikuma, Akira: *See*—
Mizuno, Yoshikazu; and Ikuma, Akira, 4,539,642, Cl. 364-426.000.
Ikuzaki, Kunihiko: *See*—
Shimohigashi, Katsuhiro; Masuda, Hiroo; Ikuzaki, Kunihiko; and Kawamoto, Hiroshi, 4,539,658, Cl. 365-207.000.
Illes, Janos: *See*—
Takacs, Istvan; Kerey, Gyorgy; Rudolf, Peter; Illes, Janos; Szabo, Bela; Vereczkey, Endre; Banos, Zoltan; Bosits, Gyula; and Czebe, Laszlo , 4,539,111, Cl. 210-179.000.
Illetschko, Gerhard, to Robert Bosch GmbH. System for reducing noise in a television signal. 4,539,594, Cl. 358-167.000.
Imaizumi, Mamoru; and Fujiwara, Takashi, to Brother Kogyo Kabushiki Kaisha. Paper feeding apparatus in a printer. 4,538,933, Cl. 400-582.000.
Imamura, Toshio; Kobayashi, Syouzo; and Hirano, Yukihisa, to Toyota Jidosha Kabushiki Kaisha. Engine cam for use in internal combustion engine. 4,538,559, Cl. 123-90.600.
Imanaka, Hiroshi: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,539,155, Cl. 260-112.50R.
IMI-Tech Corporation: *See*—
Lee, Raymond; Okey, David W.; and Ferro, Gregory A., 4,539,342, Cl. 521-189.000.
Imperial Chemical Industries PLC: *See*—
Backhouse, Alan J., 4,539,363, Cl. 524-460.000.
Brittain, David R.; Brown, David; and Wood, Robin, 4,539,329, Cl. 514-389.000.
Cozens, Ross J., 4,539,381, Cl. 526-93.000.
Davies, Stephen P.; and Thompson, Morice W., 4,539,362, Cl. 524-458.000.
McAloon, Kevin T., Heeson, Iona E.; and Cleaver, Gordon E., 4,539,046, Cl. 106-121.000.
Imperial Clevite Inc.: *See*—
Kowal, Leonard J.; and Schwarz, Albert J., 4,538,842, Cl. 285-354.000.
Inaba, Hajimu; Inagaki, Shigemi; and Ito, Susumu, to Fujitsu Fanuc Limited. Robot wrist of an industrial robot. 4,538,639, Cl. 137-580.000.
Inagaki, Shigemi: *See*—
Inaba, Hajimu; Inagaki, Shigemi; and Ito, Susumu, 4,538,639, Cl. 137-580.000.
Indak Manufacturing Corp.: *See*—
Raab, Andrew F.; and Cobb, Albert R., III, 4,539,446, Cl. 200-16.00R.
Industrie Zanussi S.p.A.: *See*—
Durazzani, Piero, 4,538,433, Cl. 68-140.000.
Ingersoll Products Corp.: *See*—
Szucs, Robert J.; and McNicholas, Sandra M., 4,538,688, Cl. 172-555.000.
Inject Star Poekelmaschinen GmbH: *See*—
Prosenbauer, Otto, 4,538,324, Cl. 17-1.00G.
Inmont Corporation: *See*—
Cowles, Richard A., 4,539,360, Cl. 524-441.000.
Panush, Sol, 4,539,258, Cl. 428-324.000.
Inoue, Arifumi: *See*—
Muroi, Akira; Sano, Masakatsu; Kamiya, Junichi; Okajima, Masao; and Inoue, Arifumi, 4,538,697, Cl. 180-68.400.
Inoue, Haruo: *See*—
Takata, Terasu; and Inoue, Haruo, 4,538,711, Cl. 192-18.00R.
Inoue, Hiroshi: *See*—
Komeya, Katsutoshi; Tsuge, Akihiko; Inoue, Hiroshi; and Ohta, Hiroyasu, 4,539,298, Cl. 501-89.000.
Inoue-Japax Incorporated: *See*—
Inoue, Kiyoshi, 4,539,458, Cl. 219-69.00M.
Inoue, Kenji: *See*—
Shinoda, Naoharu; Tatani, Atsushi; Inoue, Kenji; and Okino, Susumu, 4,539,190, Cl. 423-240.000.
Inoue, Kiyoshi, to Inoue-Japax Incorporated. Non-immersion EDM method and apparatus. 4,539,458, Cl. 219-69.00M.
Inoue, Kunio: *See*—
Hara, Senri; Tomono, Hiroshi; Kimura, Tomohiko; Inoue, Kunio; Sato, Takayuki; and Okada, Yoshio, 4,538,667, Cl. 164-418.000.
Inoue, Masaharu: *See*—
Kodama, Ikuo; Inoue, Masaharu; Shiraki, Masao; and Suzuki, Hajime, 4,538,650, Cl. 139-452.000.
Inoue, Nobuaki; Mifune, Hiroyuki; and Nakamura, Koki, to Fuji Photo Film Co., Ltd. Direct positive silver halide photographic materials. 4,539,291, Cl. 430-597.000.
Inoue, Shigeki: *See*—
Iso, Yoshimi; Inoue, Shigeki; Noda, Tsutomu; and Ohashi, Shinichi, 4,539,665, Cl. 369-44.000.
Inoue, Teruhiko: *See*—
Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; Inoue, Teruhiko; and Oomori, Kiyosi, 4,539,403, Cl. 544-326.000.
Inoue, Toshihide: *See*—
Abe, Koichi; Kawakami, Kenichi; Yoshii, Toshiya; and Inoue, Toshihide, 4,539,260, Cl. 428-336.000.
Institut National de la Recherche Scientifique: *See*—
Jean, Benoit; Bergevin, Benoit; and Rheault, Fernand, 4,538,591, Cl. 126-433.000.
Institut National de la Sante et de la Recherche Medicale: *See*—
Jutier, Pierre; Bretagnolle, Bernard; and Rubat du Merac, Claire, 4,539,593, Cl. 358-160.000.
Institute for Industrial Research & Standards: *See*—
O'Flanagan, Michael, 4,538,784, Cl. 248-244.000.
Intellectual Trade CY S.A.: *See*—
Heinen, Hans-Dieter, 4,538,389, Cl. 52-221.000.
Interco, Incorporated: *See*—
Gardner, F. Philip, 4,538,353, Cl. 33-3.00C.
International Business Machines Corporation: *See*—
Ambroise, Modeste; Demange, Michel; Lebizay, Gerald; Munier, Jean-Marie; and Peyronnenc, Michel H. P., 4,539,678, Cl. 370-86.000.
Anderson, Herbert R., Jr.; Araps, Constance J.; and Lotsko, Catherine A., 4,539,222, Cl. 427-88.000.
Bartlett, Geoffrey M.; Hofmeister, James P.; and Pring, Edward J., 4,539,653, Cl. 364-900.000.
Binnig, Gerd K.; Gerber, Christoph E.; Rohrer, Heinrich; and Weibel, Edmund, 4,539,089, Cl. 204-192.00R.
Boudon, Gerard; Mollier, Pierre; and Lebesherais, Gerard, 4,539,680, Cl. 370-100.000.
Briska, Marian; and Bahr, Dietrich J., 4,539,227, Cl. 427-179.000.
Burgess, Allan C.; Magee, Robert A.; and Melvin, George E., 4,539,058, Cl. 156-250.000.
Bux, Werner K.; Dixon, Roy C.; and Rothauser, Ernst H., 4,539,679, Cl. 370-88.000.
Chance, Dudley A.; and Sampogna, Michael, 4,539,576, Cl. 346-165.000.
Griego, Deborah B.; Hopping, Joe M.; Rehage, Teddy A.; and Rhodes, John H., Jr., 4,538,905, Cl. 355-14.0SH.

Higgins, Robert C.; Stanich, Mikel J.; and Wolfe, Larry L., 4,538,895, Cl. 355-3.00R.
Hong, Se J.; and Nair, Ravindra, 4,539,549, Cl. 340-146.200.
Lo, Yuan-Chang, 4,539,677, Cl. 370-85.000.
Lykins, Larry W., 4,538,651, Cl. 141-1.000.
Ohtani, Hiroko; and Toyokawa, Kazuharu, 4,539,506, Cl. 313-467.000.

International Computers Limited: *See—*
Thewlis, Alan, 4,538,870, Cl. 339-75.00M.

International Flavors & Fragrances Inc.: *See—*
Boden, Richard M.; and Grim, Claude, 4,539,143, Cl. 252-522.00R.
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,539,142, Cl. 252-522.00R.
Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., 4,539,209, Cl. 426-3.000.

International Standard Electric Corporation: *See—*
Fisher, David A., 4,539,675, Cl. 370-32.000.
Pease, Nicolas C., 4,538,463, Cl. 73-587.000.
Puls, Bernhard; Gruber, Hermann; Leipold, Kurt; Schonberger, Richard; Kizak, Ulrich; and Huttereer, Max, 4,539,442, Cl. 179-115.5VC.

International Telephone & Telegraph Corp.: *See—*
Cantor, Frank J.; and Horwitz, Robert P., 4,538,959, Cl. 415-98.000.

INTERO-Stahl - und Maschinenbau Schmitz GmbH & Co. KG: *See—*
Baron, Dieter, 4,538,546, Cl. 118-697.000.

Intevep, S.A.: *See—*
Schemel, Roberto; Rodriguez, Domingo; and Salazar, Ramon, 4,539,186, Cl. 423-62.000.

Inukai, Hiroshi: *See—*
Fujii, Tsuneo; Inukai, Hiroshi; Deguchi, Takayuki; Amano, Toshihiko; Kakuchi, Masami; Asakawa, Hiroshi; and Kogure, Osamu, 4,539,250, Cl. 428-195.000.

Inuzuka, Tsuneki; Kawatsura, Yoshihiro; and Ishida, Masato, to Canon Kabushiki Kaisha. Image formation apparatus. 4,538,902, Cl. 355-14.0FU.

Inwood, Thomas J., to Surf-Jet Corporation. Jet propelled boat. 4,538,996, Cl. 440-38.000.

Ipco Corporation: *See—*
Weissman, Bernard, 4,538,987, Cl. 433-60.000.

Ireland, Barry R.: *See—*
Fortune, Douglas N.; and Ireland, Barry R., 4,538,625, Cl. 130-27.0JT.

Irikura, Tsutomu; and Hasegawa, Nobuo, to Matsushita Electric Industrial Company, Limited. Solid electrolytic chip capacitor with improved terminals. 4,539,623, Cl. 361-433.000.

Iseki & Co , Ltd.: *See—*
Igarashi, Takashi; Mukai, Nakashiro; and Otsuki, Haruki, 4,538,475, Cl. 74-368.000.

Isganitis, Louis V.: *See—*
Barbetta, Angello J.; Gruber, Robert J.; Isganitis, Louis V.; Law, Kock-Yee; Lin, John W.; Koch, Ronald J.; and Dunn, Steven T., 4,539,284, Cl. 430-110.000.

Ishibashi, Masaya; Tada, Atuki; and Kanda, Jun, to Pioneer Electronic Corporation. Disc playing system with continuous playing function. 4,539,663, Cl. 369-34.000.

Ishida, Kohji; Numata, Tatsuo; and Sakamoto, Masaharu, to Pioneer Electronic Corporation. FM Stereo demodulating circuit. 4,539,697, Cl. 381-7.000.

Ishida, Masato: *See—*
Inuzuka, Tsuneki; Kawatsura, Yoshihiro; and Ishida, Masato, 4,538,902, Cl. 355-14.0FU.

Ishida, Yasuhiko: *See—*
Oishi, Kiyohiko; Ishida, Yasuhiko; and Takama, Kenichirou, 4,538,412, Cl. 60-288.000.

Ishigaki, Isao; Sugo, Takanobu; and Okamoto, Jiro, to Japan Atomic Energy Research Institute. Ion exchange membrane and process for producing the same. 4,539,277, Cl. 429-249.000.

Ishigaki, Yukinobu; and Hirohashi, Kazutoshi, to Victor Company of Japan, Ltd. Noise reduction by linear interpolation using a dual function amplifier circuit. 4,539,527, Cl. 330-149.000.

Ishihara Sangyo Kaisha, Ltd.: *See—*
Nakata, Kazuo; Maruo, Masatsuyo; and Asano, Kiyoshi, 4,539,261, Cl. 428-403.000.

Ishihara, Toshinobu: *See—*
Takamizawa, Minoru; Yamamoto, Akira; Ishihara, Toshinobu; and Ohshima, Mistuyoshi, 4,539,417, Cl. 556-435.000.

Ishii, Fumiaki, to Olympus Optical Co. Ltd. Connecting device. 4,538,593, Cl. 128-4.000.

Ishii, Hakumi: *See—*
Kurusu, Toshiro; and Ishii, Hakumi, 4,538,477, Cl. 74-493.000.
Sato, Hiroki; Toyoda, Shuhei; Yokoya, Yuji; and Ishii, Hakumi, 4,538,478, Cl. 74-493.000.

Ishii, Tamaki: *See—*
Takahashi, Yukoh; Yachigo, Shinichi; and Ishii, Tamaki, 4,539,355, Cl. 524-131.000.

Ishii, Tetsuo, to Mitsubishi Denki Kabushiki Kaisha. Power supply system. 4,539,487, Cl. 307-44.000.

Ishii, Yoshiyasu: *See—*
Nakao, Shinroku; Saito, Hideo; Kato, Hitoshi; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 4,538,830, Cl. 280-647.000.

Ishino, Ken; Hashimoto, Yasuo; and Narumiya, Yoshikazu, to TDK Corporation. Electromagnetic shield. 4,539,433, Cl. 174-35.0MS.

Ishizaka, Sunao; and Maida, Osamu, to Nippon Kogaku K.K. Camera provided with a mechanism for detecting the film speed of a film. 4,538,890, Cl. 354-21.000.

Ishizaki, Akira: *See—*
Sakai, Shinji; Harada, Yoshihito; Ishizaki, Akira; and Kawabata, Takashi, 4,538,892, Cl. 354-402.000.

Isler, Erwin, to H. Weidmann AG. Arrangement for force transfer between longitudinally stressed members. 4,538,940, Cl. 405-259.000.

Iso, Yoshimi; Inoue, Shigeki; Noda, Tsutomu; and Ohashi, Shinichi, to Hitachi, Ltd. Tracking servo control unit for an information reproducing apparatus. 4,539,665, Cl. 369-44.000.

Isomura, Akihiko: *See—*
Tomita, Kazuichi; Mano, Hiroshi; Matsuyama, Fumio; and Isomura, Akihiko, 4,539,113, Cl. 210-323.200.

Itani, Hikaru: *See—*
Yamamoto, Sadao; Itani, Hikaru; Takahashi, Hiromi; Tsuji, Teruji; and Nagata, Wataru, 4,539,148, Cl. 260-239.00A.

Itatani, Hiroshi; Kashima, Mikito; and Suehiro, Tsutomu, to UBE Industries Ltd. Process for preparing diesters of malonic acid. 4,539,423, Cl. 560-204.000.

Ito, Shotaro: *See—*
Sugio, Takashi; Obata, Makoto; and Ito, Shotaro, 4,538,963, Cl. 416-203.000.

Ito, Susumu: *See—*
Inaba, Hajimu; Inagaki, Shigemi; and Ito, Susumu, 4,538,639, Cl. 137-580.000.

Ito, Tatsuo, to Fujitsu-Ten, Ltd. Delay circuit. 4,539,712, Cl. 455-184.000.

Ito, Yukio: *See—*
Hayashi, Hideki; Takagi, Satoshi; Ito, Yukio; and Endo, Sadayoshi, 4,538,753, Cl. 226-199.000.

Itoh, Kenji, to Victor Company of Japan Ltd. Magnetic reproducing apparatus having a capstan servo circuit. 4,539,606, Cl. 360-70.000.

ITT Industries, Inc.: *See—*
Flamm, Peter M.; Mlynek, Daniel; Schmidtpott, Friedrich; and Praxmarer, Alfred, 4,539,583, Cl. 358-27.000.

Iwai, Hideki: *See—*
Takeshima, Takahiko; Akemoto, Haruo; and Iwai, Hideki, 4,538,666, Cl. 164-305.000.

Iwasa, Masaru: *See—*
Takeda, Masashi; and Iwasa, Masaru, 4,539,553, Cl. 340-347.0DA.

Iwasa, Yoshio: *See—*
Sugino, Shigemi; Sasaki, Kenichi; and Iwasa, Yoshio, 4,538,569, Cl. 123-316.000.

Iwata, Kouki: *See—*
Moriya, Kouichi; and Iwata, Kouki, 4,538,579, Cl. 123-492.000.

Izumi, Yutaka; and Kawakami, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Device for loading and ejecting a disc in a disc player. 4,539,668, Cl. 369-75.200.

Izutani, Kouji; Shigeta, Isamu; Nara, Akio; and Hayashi, Hidetaka, to Nippondenso Co., Ltd. Fuel heating type fuel filter device. 4,539,108, Cl. 210-104.000.

J. I. Case Company: *See—*
Fachini, Robert M., 4,538,403, Cl. 56-44.000.

J & L Importers, Inc.: *See—*
Oh, Chang H., 4,538,590, Cl. 126-390.000.

J. M. Huber Corporation: *See—*
Kostinko, John A., 4,539,191, Cl. 423-275.000.

J. S. Staedtler KG: *See—*
Brunner, Engelbert, 4,538,934, Cl. 401-53.000.

Jabben, Gary D., to AT&T Technologies, Inc. Click disc switch assembly. 4,539,445, Cl. 200-5.00A.

Jackson, Keith L.; and Reece, James J., to Lukens General Industries, Inc. Four-wheel passenger car truck. 4,538,525, Cl. 105-190.00R.

Jackson, Raymond G.: *See—*
Davis, Paul C.; Jackson, Raymond G.; Nahas, Joseph J.; Nelson, Dale H.; Ong, DeWitt G.; and Wittman, Brian A., 4,539,552, Cl. 340-347.0DA.

Jackson, Royce. Bucket elevator linkage for coarse coal washer. 4,539,104, Cl. 209-172.500.

Jackson, Winston J., Jr.; Kuhfuss, Herbert F.; and Watkins, Joseph J., to Eastman Kodak Company. High molecular weight unsaturated polyesters of cyclohexanedimethanols. 4,539,390, Cl. 528-303.000.

Jacob, Herbert; Rurlander, Robert; and Schnegg, Anton, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe m.b.H. Process for the chemical vapor deposition of oxidic particles. 4,539,221, Cl. 427-53.100.

Jacob, Keith D.: *See—*
Angott, Paul G.; and Jacob, Keith D., 4,538,973, Cl. 417-572.000.

Jacobi, Haireddin: *See—*
Opitz, Wolfgang; Jacobi, Haireddin; and Pelster, Bernhard, 4,539,402, Cl. 544-247.000.

Jacobs, Paul H.; and Collette, Douglas P., to Aerotron, Inc. Compressed single side band communications system and method. 4,539,707, Cl. 455-47.000.

Jacobs, Stanley A. Container and lid. 4,538,741, Cl. 215-320.000.

Jacuzzi Inc.: *See—*
Wilkes, Robert D., 4,539,498, Cl. 310-87.000.

Jahn, Martin D.: *See—*
Skrabis, Thomas S.; and Jahn, Martin D., 4,538,391, Cl. 52-478.000.

Jaki, Ivan, to Telefonaktiebolaget LM Ericsson. Direct current magnetized hybrid transformer. 4,539,443, Cl. 179-170.00D.

Jamak, Inc.: *See—*
Vogel, K. Stuart, 4,538,381, Cl. 49-479.000.

James, Claude: *See—*
Fabre, Jean-Louis; Farge, Daniel; James, Claude; and Lave , Daniel, 4,539,400, Cl. 544-47.000.

James, Richard K.: *See*—
Ariessohn, Peter C.; and James, Richard K., 4,539,588, Cl. 358-113.000.

James River/Dixie-Northern, Inc.: *See*—
Kuchenbecker, Morris W., 4,538,732, Cl. 206-613.000.

Janome Sewing Machine Industry Co., Ltd.: *See*—
Hanyu, Susumu; and Yamaguchi, Yoshio, 4,538,535, Cl. 112-270.000.
Takenoya, Hideaki; and Mishima, Fumiyuki, 4,538,932, Cl. 400-185.000.

Janssen Pharmaceutica N.V.: *See*—
Heeres, Jan, 4,539,325, Cl. 514-283.000.

Janzen, James H., Jr.: *See*—
Janzen, James H., Sr.; and Janzen, James H., Jr., 4,538,434, Cl. 70-178.000.

Janzen, James H., Sr.; and Janzen, James H., Jr. Security housing for oil storage tank valve. 4,538,434, Cl. 70-178.000.

Japan Atomic Energy Research Institute: *See*—
Ishigaki, Isao; Sugo, Takanobu; and Okamoto, Jiro, 4,539,277, Cl. 429-249.000.

Japan Aviation Electronics Industry: *See*—
Ichimura, Yoshiaki, 4,538,864, Cl. 339-17.0CF.

Japan Bano'k Co., Ltd.: *See*—
Furutsu, Akira, 4,538,754, Cl. 227-67.000.

Japan Storage Battery Company Limited: *See*—
Fujita, Yuko; and Kudo, Hisashi, 4,539,086, Cl. 204-129.000.

Jarczyn, Henry N., to Urotek Inc. Urodynamic catheter. 4,538,621, Cl. 128-748.000.

Jarocinski, Richard; Keaton, William R.; and Magennis, Joseph L., to GTE Automatic Electric Incorporated. Exposure of photo resist. 4,539,070, Cl. 156-659.100.

Jarvis, John F.; Swartz, Robert G.; and Wooley, Bruce A., to AT&T Bell Laboratories. Analog integrated circuit pressure sensor. 4,539,554, Cl. 345-365.00A.

Jean, Benoit; Bergevin, Benoit; and Rheault, Fernand, to Institut National de la Recherche Scientifique. Solar heating system. 4,538,591, Cl. 126-433.000.

Jean Walterscheid GmbH: *See*—
Konrad, Mathias; and Kampf, Klaus, 4,538,715, Cl. 192-56.00R.

Jenck, Jean, to Rhone-Poulenc Chimie de Base. Preparation of linear esters by carbonylation of monoolefins. 4,539,424, Cl. 560-204.000.

Jeneric Industries, Inc.: *See*—
Prasad, Arun, 4,539,177, Cl. 420-463.000.

Jensen, Anton B. Apparatus having bottom air channels for air drying of grain in a drying store and for conveying the grain away from the store. 4,538,364, Cl. 34-233.000.

Jensen, Arne. Transducer for the simultaneous measurement of different physiological quantities. 4,538,617, Cl. 128-635.000.

Jer Manufacturing, Inc.: *See*—
Mitchell, Terry L., 4,538,393, Cl. 52-641.000.

Jesse, Erich: *See*—
Michel, Hartmut; Gademann, Lothar; and Jesse, Erich, 4,539,492, Cl. 307-315.000.

Jidosha Kiki Co., Ltd.: *See*—
Nikaido, Masaya, 4,538,966, Cl. 417-288.000.

Jim Walter Resources, Inc.: *See*—
Hallmark, Richard K.; Skowronski, Michael J.; and Stephens, William D., 4,539,341, Cl. 521-172.000.

Jimco Products: *See*—
Ballard, James W., 4,538,508, Cl. 98-42.170.

Jimenez, Hernan N.: *See*—
Artinano, Antonio T.; Jimenez, Hernan N.; Thalman, Bernal C.; and Vasquez, Marco A. E., 4,539,480, Cl. 250-551.000.

Jiruse, Jaroslav: *See*—
Sedlak, Vaclav; and Jiruse, Jaroslav, 4,538,513, Cl. 101-76.000.

Jochemczyk, Claus; Kwiatkowski, Joachim; and Herrmann, Klaus, to Robert Bosch GmbH. Electrical temperature sensor, particularly for fever thermometer use. 4,538,927, Cl. 374-163.000.

Johannsen, Donald R., to Carris, Bonni S. Apparatus for sharpening a knife blade or the like. 4,538,382, Cl. 51-69.000.

Johenning, John B.: *See*—
Hall, Charles P.; Philipson, Joseph; and Johenning, John B., 4,538,311, Cl. 5-451.000.

John Fluke Mfg. Co., Inc.: *See*—
Eng, Benjamin, Jr.; Anholm, John M., Jr.; and Duryee, Peter S., 4,539,550, Cl. 340-347.0AD.

John Wyeth & Brother Limited: *See*—
Crossley, Roger, 4,539,406, Cl. 546-14.000.

Johnson, Bruce S.; and Borst, Paul H., to Harsco Corporation. Battlefield magazine. 4,538,723, Cl. 206-3.000.

Johnson, Bruce S., to Harsco Corporation. Spiral band locking mechanism. 4,538,724, Cl. 206-3.000.

Johnson, Jerry R., to Transworld Drilling Company. Method for ballasting a vessel. 4,538,939, Cl. 405-205.000.

Johnson, Larry, to Lawrence Brothers, Inc. Bearing supported truck assembly for sliding door. 4,538,323, Cl. 16-98.000.

Johnson, Leighton C.; and King, James S., Jr., to Miles Laboratories, Inc. Automated reagent blotter. 4,539,182, Cl. 422-99.000.

Johnson, Lennart B., to Teradyne, Inc. Backplane connector. 4,538,866, Cl. 339-17.0LM.

Johnson, Lloyd A.: *See*—
Hansen, John C.; and Johnson, Lloyd A., 4,539,632, Cl. 364-143.000.

Johnson, Mark R., to Dow Chemical Company, The. Process for reaction of mercaptophenols with vinyl compounds. 4,539,159, Cl. 260-465.00F.

Johnson Matthey PLC: *See*—
Hall, William G.; and Boswell, Peter G., 4,538,876, Cl. 339-118.00R.

Johnson Matthey Public Limited Company: *See*—
Harrison, Brian; and Diwell, Alan F., 4,539,311, Cl. 502-304.000.

Johnson, William H. Portable mixing device. 4,538,922, Cl. 366-318.000.

Johnston, Russell A., to Camco, Incorporated. Soft set and pull latch and setting tool for a well measuring instrument. 4,538,681, Cl. 166-125.000.

Johoku Kogyo Kabushiki Kaisha: *See*—
Wakuta, Koichi, 4,538,582, Cl. 123-538.000.

Jonath, Arthur D.: *See*—
Hartog, Jan J.; Bellin, Jack L.; Knollman, Gilbert C.; and Jonath, Arthur D., 4,538,462, Cl. 73-577.000.

Jonckers, Kees; Van Nassau, Petrus J. M.; and Biermans, Andreas J., to Unie van Kunstmestfabrieken B.V. Process for the preparation of urea. 4,539,077, Cl. 203-49.000.

Jones, Bryan F.: *See*—
Denbigh, Paul L.; Seddon, Richard J.; and Jones, Bryan F., 4,539,511, Cl. 313-624.000.

Jones, Charles U.: *See*—
Mainwaring, David E.; and Jones, Charles U., 4,539,010, Cl. 44-1.00C.

Jones, Jesse D.: *See*—
Chung, James Y. J.; Jones, Jesse D.; and Li, Hsueh M., 4,539,352, Cl. 524-109.000.

Jos. Cavedon Company Inc.: *See*—
Cohen, Lawrence B., 4,539,048, Cl. 106-287.170.
Cohen, Lawrence B., 4,539,049, Cl. 106-287.170.

Juptner, William F.; Macy, David F.; and Staudte, Juergen H., to Piezoelectric Technology Investors, Inc. Vibratory angular rate sensing system. 4,538,461, Cl. 73-505.000.

Jutier, Pierre; Bretagnolle, Bernard; and Rubat du Merac, Claire, to Institut National de la Sante et de la Recherche Medicale. Apparatus for the acquisition and restoration in real time of a picture formed from successive frames of scanning lines. 4,539,593, Cl. 358-160.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Yoshida, Yosuke, 4,538,923, Cl. 368-70.000.

Kabushiki Kaisha Murakoshi Seiko: *See*—
Watanabe, Minoru, 4,538,844, Cl. 292-127.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakushao: *See*—
Kawaguchi, Teruhiko; Nishimura, Yuji; and Fujiwara, Akinori, 4,538,774, Cl. 242-107.000.

Kabushiki Kaisha Toshiba: *See*—
Miyazaki, Koichi; and Aoki, Masayuki, 4,539,453, Cl. 219-10.55C.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kodama, Ikuo; Inoue, Masaharu; Shiraki, Masao; and Suzuki, Hajime, 4,538,650, Cl. 139-452.000.

Kadoi, Sho; and Aya, Toshihiko, to Toray Industries, Inc. Method of preparing polyimide prepolymer from ethylenically unsaturated dicarboxylic acid compound. 4,539,392, Cl. 528-336.000.

Kaepa, Inc.: *See*—
Adams, Thomas M., 4,538,367, Cl. 36-50.000.

Kafitz, Egon: *See*—
Peetz, Walter; Wilking, Hans; and Kafitz, Egon, 4,538,855, Cl. 297-362.000.

Kagata, Tooru; and Fujikawa, Motoi, to Aisin Seiki Kabushiki Kaisha. Wheel hub clutch assembly. 4,538,714, Cl. 192-54.000.

Kahan, Frederick M.; and Kropp, Helmut, to Merck & Co., Inc. Combination of thienamycin-type antibiotics with dipeptidase inhibitors. 4,539,208, Cl. 514-192.000.

Kahmann, Albrecht: *See*—
Mayr, Hermann; Kahmann, Albrecht; Lambrecht, Gerhard; Heinbockel, Wolfgang; Siewert, Wolfgang; and Maier, Josef, 4,538,765, Cl. 241-21.000.

Kainulainen, Raimo; Sipponen, Antti; and Toivola, Tuomo. Procedure for manufacturing a building element, and the building element. 4,539,241, Cl. 428-71.000.

Kakuchi, Masami: *See*—
Fujii, Tsuneo; Inukai, Hiroshi; Deguchi, Takayuki; Amano, Toshihiko; Kakuchi, Masami; Asakawa, Hiroshi; and Kogure, Osamu, 4,539,250, Cl. 428-195.000.

Kalkbrenner, Ralph W.; and Kobuck, Richard M., to Westinghouse Electric Corp. Workpiece gripping and manipulating apparatus for laser welding systems and the like. 4,538,956, Cl. 414-735.000.

Kamata, Kunio: *See*—
Iino, Toshiki; and Kamata, Kunio, 4,538,960, Cl. 415-104.000.

Kamei, Sakito: *See*—
Ohta, Michio; Kamei, Sakito; and Aoki, Kazumi, 4,538,481, Cl. 74-603.000.

Kami, Yozo; Minakawa, Masaaki; and Kubo, Kenji, to Honda Giken Kogyo Kabushiki Kaisha. Suspension for vehicles. 4,538,831, Cl. 280-666.000.

Kamiuchi, Hideaki: *See*—
Ojima, Shin; Kamiuchi, Hideaki; and Mine, Keiji, 4,538,509, Cl. 99-348.000.

Kamiya, Junichi: *See*—
Muroi, Akira; Sano, Masakatsu; Kamiya, Junichi; Okajima, Masao; and Inoue, Arifumi, 4,538,697, Cl. 180-68.400.

Kamiya, Toji: *See*—
Sato, Keishi; Nishida, Takeshi; Kamiya, Toji; and Tanaka, Yutaka, 4,539,255, Cl. 428-252.000.

Kampf, Klaus: *See*—
Konrad, Mathias; and Kampf, Klaus, 4,538,715, Cl. 192-56.00R.

Kampfer, Helmut; Hase, Marie; and Glass, Max, to Agfa-Gevaert Aktiengesellschaft. Process for the preparation of sulphoalkyl quaternary salts. 4,539,408, Cl. 546-139.000.

Kan, Shigenobu: *See*—
Takamizawa, Masae; Kan, Shigenobu; and Mukainakano, Masato, 4,538,401, Cl. 56-11.800.

Kanai, Takao; and Chaki, Takao, to Clarion Co., Ltd. Cross-arm mechanism in a pushbutton tuner. 4,538,473, Cl. 74-10.330.

Kanazawa, Yasunori: *See*—
Arai, Takao; Yamazaki, Shigeru; Kanazawa, Yasunori; and Noguchi, Takaharu, 4,539,615, Cl. 360-121.000.

Kanbe, Junichiro: *See*—
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,539,283, Cl. 430-61.000.

Kanda, Jun: *See*—
Ishibashi, Masaya; Tada, Atuki; and Kanda, Jun, 4,539,663, Cl. 369-34.000.

Kandarian, Ernest. Protective cover for cotton module. 4,538,385, Cl. 52-3.000.

Kanebo Ltd.: *See*—
Sato, Keishi; Nishida, Takeshi; Kamiya, Toji; and Tanaka, Yutaka, 4,539,255, Cl. 428-252.000.

Kaneda, Hiroshi; Shibata, Kenji; Nomura, Mitugu; and Sano, Fumihiko, to Babcock-Hitachi, Ltd. Electrodialysis desalination process system for seawater. 4,539,088, Cl. 204-182.500.

Kaneda, Hiroshi; Shibata, Kenji; Nomura, Mitugu; and Sano, Fumihiko, to Babcock-Hitachi, Ltd. Electrodialysis desalination process and system for seawater. 4,539,091, Cl. 204-301.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kato, Yasushi; and Furukawa, Hisao, 4,539,359, Cl. 524-376.000.
Mori, Kiyoshi; and Nakagawa, Masao, 4,539,335, Cl. 521-60.000.
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; and Kishi, Takamichi, 4,539,083, Cl. 204-98.000.
Yasui, Hideo; and Miki, Yasuhiro, 4,539,396, Cl. 528-481.000.

Kaneko, Ichiro: *See*—
Shimizu, Toshihide; Kaneko, Ichiro; and Shimakura, Yoshiteru, 4,539,230, Cl. 427-230.000.

Kaneko, Kazuo; Gonda, Michihiro; Suzuka, Susumu; and Kitsukawa, Katsumasa, to Hodogaya Chemical Co., Ltd. Heat sensitive record material. 4,539,577, Cl. 346-207.000.

Kaneko, Sinobu; and Nakade, Hiroyuki, to Kotobuki Seihan Printing Co., Ltd. Method of and apparatus for identifying presensitized offset printing plates. 4,539,647, Cl. 364-526.000.

Kaneko, Toshiaki; Takita, Ichiro; and Shikano, Hiroshi, to Kurosaki Refractories Co., Ltd. Graphite-containing refractories. 4,539,301, Cl. 501-99.000.

Kaneko, Toshio: *See*—
Kanno, Fuchio; Kaneko, Toshio; and Sakamoto, Koji, 4,538,898, Cl. 355-3.0DD.

Kanno, Fuchio; Kaneko, Toshio; and Sakamoto, Koji, to Ricoh Company, Ltd. Developing device. 4,538,898, Cl. 355-3.0DD.

Kano, Toshiji: *See*—
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; and Kishi, Takamichi, 4,539,083, Cl. 204-98.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Kojima, Kazuo; Yamahira, Hitoshi; and Oeda, Yoshitaka, 4,539,225, Cl. 427-150.000.

Kao, Ming L.: *See*—
Chiu, Ran F.; Kromer, Philip F., III; Kao, Ming L.; and Parrish, Henry H., 4,539,689, Cl. 375-13.000.

Kapland, Mitchell A.; and Robinson, Melville W., Jr. Bay mud stabilization. 4,539,121, Cl. 210-751.000.

Karis, Arthur T.: *See*—
Frye, Kenneth G.; and Karis, Arthur T., 4,539,072, Cl. 162-197.000.

Kashima, Mikito: *See*—
Itatani, Hiroshi; Kashima, Mikito; and Suehiro, Tsutomu, 4,539,423, Cl. 560-204.000.

Kast, Howard B., to General Electric Company. Fail-safe servovalve system. 4,538,504, Cl. 91-461.000.

Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; and Shirakawa, Isao, to Mitsui Toatsu Chemicals, Inc. Benzothiazepine derivatives and their methods of preparation. 4,539,150, Cl. 260-239.30B.

Katakami, Tsutomu; Fukazawa, Nobuyuki; and Iizuka, Hajime, to Mitsui Toatsu Chemicals, Inc. Benzothiazepine derivatives and their method of preparation. 4,539,151, Cl. 260-239.30B.

Kato, Hitoshi: *See*—
Nakao, Shinroku; Saito, Hideo; Kato, Hitoshi; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 4,538,830, Cl. 280-647.000.

Kato, Shigeru: *See*—
Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, 4,539,662, Cl. 369-13.000.

Kato, Toshikazu; and Osanai, Akira, to Olympus Optical Co., Ltd. Cassette tape recorder. 4,539,609, Cl. 360-93.000.

Kato, Yasushi; and Furukawa, Hisao, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. One component curing composition. 4,539,359, Cl. 524-376.000.

Katsumoto, Naoaki; Ohshiro, Hideyuki; and Sakai, Masanori, to Shiroki Kinzoku Kogyo Kabushiki Kaisha. Reclining angle adjustment device. 4,538,856, Cl. 297-367.000.

Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, to Thomas Jefferson University. Replaceable saliva barrier for intra-oral larynx. 4,539,698, Cl. 381-70.000.

Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, to Thomas Jefferson University. Replaceable battery pack for intra-oral larynx. 4,539,699, Cl. 381-70.000.

Kawabata, Takashi: *See*—
Sakai, Shinji; Harada, Yoshihito; Ishizaki, Akira; and Kawabata, Takashi, 4,538,892, Cl. 354-402.000.

Kawabe, Toshihiko: *See*—
Amemori, Koichi; Kawabe, Toshihiko; and Miyazaki, Manabu, 4,538,561, Cl. 123-90.440.

Kawagoe, Takashi: *See*—
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,538,950, Cl. 414-222.000.

Kawaguchi, Teruhiko; Nishimura, Yuji; and Fujiwara, Akinori, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakushao. Webbing tension device. 4,538,774, Cl. 242-107.000.

Kawakami, Hiroshi: *See*—
Izumi, Yutaka; and Kawakami, Hiroshi, 4,539,668, Cl. 369-75.200.

Kawakami, Kenichi: *See*—
Abe, Koichi; Kawakami, Kenichi; Yoshii, Toshiya; and Inoue, Toshihide, 4,539,260, Cl. 428-336.000.

Kawamoto, Hiroshi: *See*—
Shimohigashi, Katsuhiro; Masuda, Hiroo; Ikuzaki, Kunihiko; and Kawamoto, Hiroshi, 4,539,658, Cl. 365-207.000.

Kawamoto, Yasuo, to Hitachi, Ltd. Refrigerating system. 4,538,421, Cl. 62-157.000.

Kawamura, Fumio: *See*—
Morimoto, Junichi; Kawamura, Fumio; Watanabe, Akira; Suzuki, Yoshio; and Kawamura, Masamichi, 4,539,282, Cl. 430-59.000.

Kawamura, Masamichi: *See*—
Morimoto, Junichi; Kawamura, Fumio; Watanabe, Akira; Suzuki, Yoshio; and Kawamura, Masamichi, 4,539,282, Cl. 430-59.000.

Kawanabe, Yoshihiro: *See*—
Nishioka, Akira; Kawanabe, Yoshihiro; Takahori, Hiroyuki; and Fujimoto, Hideki, 4,539,491, Cl. 307-297.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo; and Abe, Shinji, 4,538,568, Cl. 123-310.000.

Kawasaki Steel Corporation: *See*—
Sakuraya, Toshikazu; Fujii, Tetsuya; Matsui, Shigeo; and Hayashi, Shigeki, 4,539,020, Cl. 55-26.000.

Kawashimo, Norishige; and Nakajima, Joe, to Hitachi, Ltd. Data processor in automobiles. 4,539,641, Cl. 364-424.000.

Kawatsura, Yoshihiro: *See*—
Inuzuka, Tsuneki; Kawatsura, Yoshihiro; and Ishida, Masato, 4,538,902, Cl. 355-14.0FU.

Kayser-Roth Hosiery, Inc.: *See*—
Frazier, Estill G.; and Kiger, William P., Jr., 4,538,534, Cl. 112-262.200.

Keaton, William R.: *See*—
Jarocinski, Richard; Keaton, William R.; and Magennis, Joseph L., 4,539,070, Cl. 156-659.100.

Keeling, Harmon H.: *See*—
Hudspeth, Thomas; Basil, Richard V., Jr.; and Keeling, Harmon H., 4,539,534, Cl. 333-115.000.

Keiper Recaro GmbH & Co.: *See*—
Peetz, Walter; Wilking, Hans; and Kafitz, Egon, 4,538,855, Cl. 297-362.000.

Keller, Arnold: *See*—
Engelbrecht, Eckart; Nieder, Elmar; and Keller, Arnold, 4,538,305, Cl. 623-20.000.

Kelley, Albert W. Animal trap for ground moles and the like. 4,538,375, Cl. 43-77.000.

Kelley, Douglas P., to Electric Power Research Institute, Inc. Cable gripping apparatus having forward and rearward movement capabilities. 4,538,522, Cl. 104-287.000.

Kelly, Hugh; and Krass, Alvin. Portable, disposable warning device for detecting urine-wet undergarments. 4,539,559, Cl. 340-573.000.

Kelman, Charles D. Surgical instrument and method of cutting a lens of an eye. 4,538,611, Cl. 128-305.000.

Kelterborn, Jeffrey C.; and Stone, Richard A., to Standard Oil Company (Indiana). Method for filtering solvent and tar sand mixtures. 4,539,097, Cl. 208-11.0LE.

Kemmner, Ulrich: *See*—
Ruhl, Karl; and Kemmner, Ulrich, 4,538,977, Cl. 418-150.000.

Kendall Company, The: *See*—
Quarfoot, Alan, 4,539,200, Cl. 424-81.000.

Kenik, Frank W., to Outboard Marine Corporation. Liquid flow meter. 4,538,445, Cl. 73-3.000.

Kennecott Corporation: *See*—
Nunlist, Erwin J., 4,538,543, Cl. 118-308.000.

Kennedy, David K., to Allied Corporation. Apparatus and method for slurrying soda ash. 4,538,921, Cl. 366-178.000.

Kennon, James L.; Sieminski, Richard; Sharpless, John; and Scharf, Donald, to Nordson Corporation. System for spray coating substrates. 4,538,542, Cl. 118-302.000.

Kent-Tieghi S.p.A.: *See*—
Bianchi, Gianfranco; Pierpaoli, Piero; Borelli, Riccardo; and Rainoldi, Luciano, 4,538,465, Cl. 73-722.000.

Kerber, George L. Capacitance pressure transducer and method of fabrication therefor. 4,538,466, Cl. 73-724.000.

Kerey, Gyorgy: *See*—
Takacs, Istvan; Kerey, Gyorgy; Rudolf, Peter; Illes, Janos; Szabo, Bela; Vereczkey, Endre; Banos, Zoltan; Bosits, Gyula; and Czebe, Laszlo , 4,539,111, Cl. 210-179.000.

Ketchum & Co. Inc.: *See*—
Trager, Seymour F.; and Chylinski, Victoria S., 4,539,330, Cl. 514-398.000.

Kewpie Kabushiki Kaisha: *See*—
Takano, Motoharu, 4,538,489, Cl. 82-71.000.

Khachaturian, Jon E.; and Charles, Joseph P., to Versabar, Inc. Spreader bar assembly. 4,538,849, Cl. 294-81.100.

Kidaloski, Raymond G.: *See—*
Haller, Kurt H.; and Kidaloski, Raymond G., 4,538,550, Cl. 122-235.00G.

Kienzle Apparate GmbH: *See—*
Adams, Jurgen; and Schelling, Hugo, 4,539,644, Cl. 364-467.000.
Goedecke, Wolf-Dieter; Schneckenburger, Gerhard; and Schwenzer, Reinhard, 4,538,643, Cl. 137-625.640.

Kifer, Edward W.: *See—*
Carlson, John D.; Kifer, Edward W.; Wojtyna, Vincent J.; and Colton, James P., 4,539,338, Cl. 521-131.000.

Kiger, William P., Jr.: *See—*
Frazier, Estill G.; and Kiger, William P., Jr., 4,538,534, Cl. 112-262.200.

Kilgour, Jonathan R. Apparatus for drilling and inserting a horizontal pipe. 4,538,858, Cl. 299-55.000.

Kim, Bumman: *See—*
Bayraktaroglu, Burhan; Kim, Bumman; and Frensley, William, 4,539,528, Cl. 330-287.000.

Kimpel, Rolf-Dieter; Stadler, Heinz; and Heinzl, Alfred, to Siemens Aktiengesellschaft. Electromagnetic rotating armature relay. 4,539,540, Cl. 335-125.000.

Kimura, Takeo: *See—*
Kuboyama, Keiji; Matsui, Takeki; and Kimura, Takeo, 4,539,178, Cl. 420-555.000.

Kimura, Tomohiko: *See—*
Hara, Senri; Tomono, Hiroshi; Kimura, Tomohiko; Inoue, Kunio; Sato, Takayuki; and Okada, Yoshio, 4,538,667, Cl. 164-418.000.

King, James S., Jr.: *See—*
Johnson, Leighton C.; and King, James S., Jr., 4,539,182, Cl. 422-99.000.

King, Ming L.; Chiang, Chin-Chih; Ling, Han-Chin; Ochiai, Masahito; Fujita, Eiichi; and McPhail, Andrew T. 1H-Cyclopenta[b]benzofuran derivative and its analog. 4,539,414, Cl. 549-458.000.

Kingston, Charles M.: *See—*
Eby, John E.; and Kingston, Charles M., 4,539,587, Cl. 358-107.000.

Kinoshita, Takao; Tsunekawa, Tokuichi; and Sato, Yuichi, to Canon Kabushiki Kaisha. Solid state image pickup device. 4,539,597, Cl. 358-213.000.

Kiriyama, Tsutomu; Horie, Shigeru; Ichihashi, Tetsuo; and Oshida, Masahiro, to Teijin Limited. Biaxially oriented polyester film. 4,539,389, Cl. 528-272.000.

Kirschenbaum, Bernard, to AT&T Information Systems Inc. Electrical cable supporting clamp. 4,538,782, Cl. 248-68.100.

Kishi, Takamichi: *See—*
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; and Kishi, Takamichi, 4,539,083, Cl. 204-98.000.

Kitajima, Koji: *See—*
Tsuchihashi, Gen-Ichi; Mitamura, Shuichi; and Kitajima, Koji, 4,539,420, Cl. 560-056.000.

Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, to Fuisawa Pharmaceutical Company, Ltd. New peptide, process for preparation thereof and use thereof. 4,539,155, Cl. 260-112.50R.

Kitayoshi, Hitoshi, to Takeda Riken Co., Ltd. Signal generator for digital spectrum analyzer. 4,539,518, Cl. 324-77.00B.

Kitchen, Cedric A., to Pilkington P.E. Limited. Security system. 4,538,527, Cl. 109-21.000.

Kite, John. Power plate. 4,538,555, Cl. 123-52.00M.

Kitsukawa, Katsumasa: *See—*
Kaneko, Kazuo; Gonda, Michihiro; Suzuka, Susumu; and Kitsukawa, Katsumasa, 4,539,577, Cl. 346-207.000.

Kiyama, Masao: *See—*
Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, 4,539,129, Cl. 252-62.630.

Kizak, Ulrich: *See—*
Puls, Bernhard; Gruber, Hermann; Leipold, Kurt; Schonberger, Richard; Kizak, Ulrich; and Huttereer, Max, 4,539,442, Cl. 179-115.5VC.

Klaebo, Per, to A/S Kongsberg Vapenfabrikk. Compressor diffuser non-return valve and method for starting gas turbine engines. 4,538,410, Cl. 60-39.020.

Klehr, Peter: *See—*
Schanz, Klaus; Schwind, Albert; Grund, Hartmut; and Klehr, Peter, 4,539,195, Cl. 423-419.00P.

Kleiner, Raymond W.: *See—*
Kleiner, Rudolph R.; Kleiner, Raymond W.; and Bowie, Richard T., Sr., 4,538,557, Cl. 123-78.00E.

Kleiner, Rudolph R.; Kleiner, Raymond W.; and Bowie, Richard T., Sr. Internal combustion engine. 4,538,557, Cl. 123-78.00E.

Kleintjens, Ludovicus A. L.; and Grooten, Hubertus M. J., to Stamicarbon B.V. Process for the preparation of benzoic acid. 4,539,425, Cl. 562-412.000.

Klesse, Wolfgang: *See—*
Siol, Werner; Klesse, Wolfgang; Suetterlin, Norbert; and Rauch, Hubert, 4,539,361, Cl. 524-458.000.

Kliklok Corporation: *See—*
Henry, Nelson R.; Cutler, Duncan B.; and Warner, William L., 4,538,692, Cl. 177-1.000.

Klingenmeier, Erich A.: *See—*
Michalik, Horst B.; and Klingenmeier, Erich A., 4,538,517, Cl. 101-227.000.

Kloker, Kevin L., to Motorola, Inc. Automatic frame synchronization recovery utilizing a sequential decoder. 4,539,684, Cl. 371-46.000.

Klopfenstein, King L.; Connors, Robert H.; and Bergholt, Steven P., to Triangle Package Machinery Co. Weighing machine. 4,538,693, Cl. 177-25.000.

Klotz, Helmut; and Bloch, Klaus, to Bayer Aktiengesellschaft. Woven diaphragm for aqueous electrolytes. 4,539,082, Cl. 204-93.000.

Klotz, Willi, to Microtherm GmbH. Thermal switch. 4,539,545, Cl. 337-380.000.

Klufas, Oleg, to General Electric Company. Method and apparatus for axially aligning the coupled shafts of a steam turbine. 4,538,455, Cl. 73-118.000.

Klug, Rudolf: *See—*
Merrem, Hans-Joachim; Neisius, Karlheinz; Klug, Rudolf; and Hartner, Hartmut, 4,539,288, Cl. 430-325.000.

KMW Aktiebolag: *See—*
Andersson, Anders I., 4,539,073, Cl. 162-198.000.
Stenberg, Erik G., 4,539,074, Cl. 162-198.000.

Knauer, Karl: *See—*
Pfleiderer, Hans-Joerg; and Knauer, Karl, 4,539,537, Cl. 333-165.000.

Knepshield, William R.; Ogletree, David D.; and Sander, Nat, to KOI Associates, Inc. Surgical knife with controllably extendable blade and gauge therefor. 4,538,356, Cl. 33-185.00R.

Knipp, Ulrich: *See—*
Richartz, Adolf; Reichmann, Wolfgang; and Knipp, Ulrich, 4,539,166, Cl. 264-45.100.

Knollman, Gilbert C.: *See—*
Hartog, Jan J.; Bellin, Jack L.; Knollman, Gilbert C.; and Jonath, Arthur D., 4,538,462, Cl. 73-577.000.

Knutson, Dale A.; and Fritz, Frank, to Applied Power Inc. Pressure regulator. 4,538,644, Cl. 137-625.640.

Kobayashi, Shigenobu: *See—*
Sasaki, Yoshiyuki; Kobayashi, Shigenobu; Okamoto, Tetsuo; and Minemura, Norihiro, 4,539,242, Cl. 428-92.000.

Kobayashi, Shinma, to Nissan Shatai Company, Limited. Air conditioner control arrangement for automotive vehicle or the like. 4,538,760, Cl. 237-2.00A.

Kobayashi, Syouzo: *See—*
Imamura, Toshio; Kobayashi, Syouzo; and Hirano, Yukihisa, 4,538,559, Cl. 123-90.600.

Kobayashi, Yasushi; and Umezawa, Hidetsugu, to Nissan Motor Co., Ltd. Weft picking device of air jet type weaving loom. 4,538,649, Cl. 139-435.000.

Kobel, Alfons; and Damm, Norbert, to BMD Badische Maschinenfabrik Durlach GmbH. Process and apparatus for compacting mold material. 4,538,664, Cl. 164-37.000.

Kobuck, Richard M.: *See—*
Kalkbrenner, Ralph W.; and Kobuck, Richard M., 4,538,956, Cl. 414-735.000.

Koch, Franz P., to Hauni-Werke Korber & Co. KG. Apparatus for testing cigarettes or the like. 4,538,450, Cl. 73-38.000.

Koch, Robert, to Hubner Gummi-Und Kunstsoff GmbH. Bellows for articulated vehicles. 4,538,523, Cl. 105-20.000.

Koch, Ronald J.: *See—*
Barbetta, Angello J.; Gruber, Robert J.; Isganitis, Louis V.; Law, Kock-Yee; Lin, John W.; Koch, Ronald J.; and Dunn, Steven T., 4,539,284, Cl. 430-110.000.

Koch, Ulrich H.: *See—*
Williams, Peter C.; Koch, Ulrich H.; Yusko, Edward M., Jr.; and Mannion, Thomas M., 4,538,790, Cl. 251-214.000.

Koch, William R., to Air Products & Chemicals, Inc. Control system for air fractionation by selective adsorption. 4,539,019, Cl. 55-21.000.

Kodama, Ikuo; Inoue, Masaharu; Shiraki, Masao; and Suzuki, Hajime, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method for preparing weft supply to be picked upon starting the operation of a weaving loom, and an apparatus for effecting the same. 4,538,650, Cl. 139-452.000.

Koenig, Albert A.: *See—*
Brady, Joseph H.; Koenig, Albert A.; and Straub, Harry, 4,538,834, Cl. 285-10.000.

Koenig & Bauer Aktiengesellschaft: *See—*
Michalik, Horst B.; and Klingenmeier, Erich A., 4,538,517, Cl. 101-227.000.

Koerber, Clement J., Sr.: *See—*
Fleck, David C.; Novak, Joseph H.; and Koerber, Clement J., Sr., 4,539,560, Cl. 340-573.000.

Kogure, Osamu: *See—*
Fujii, Tsuneo; Inukai, Hiroshi; Deguchi, Takayuki; Amano, Toshihiko; Kakuchi, Masami; Asakawa, Hiroshi; and Kogure, Osamu, 4,539,250, Cl. 428-195.000.

Kohda, Katsuhiro; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Process for the preparation of phosphor. 4,539,137, Cl. 252-301.40H.

Kohn, Harold B.: *See—*
Clark, Malcolm W.; and Kohn, Harold B., 4,539,183, Cl. 422-143.000.

Kohsaka, Masanobu: *See—*
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,539,155, Cl. 260-112.50R.

KOI Associates, Inc.: *See—*
Knepshield, William R.; Ogletree, David D.; and Sander, Nat, 4,538,356, Cl. 33-185.00R.

Koike, Tatsuhiro: *See*—
Kozuki, Koichi; and Koike, Tatsuhiro, 4,538,500, Cl. 84-462.000.

Koizumi, Yutaka: *See*—
Watanabe, Takashi; Ozawa, Masakazu; Koizumi, Yutaka; and Matsumoto, Haruyuki, 4,539,569, Cl. 346-140.00R.

Kojima, Akira: *See*—
Ichikawa, Yasunori; Yamaguchi, Shigeru; Kojima, Akira; and Fujiwara, Kazuhiko, 4,539,139, Cl. 252-314.000.

Kojima, Kazuo; Yamahira, Hitoshi; and Oeda, Yoshitaka, to Kanzaki Paper Manufacturing Co., Ltd. Method for the production of a heat-sensitive record material. 4,539,225, Cl. 427-150.000.

Kokubun, Yoshihiro: *See*—
Washizuka, Syoichi; Ushizawa, Jisaburo; Kokubun, Yoshihiro; and Fukuda, Tsuguo, 4,539,067, Cl. 156-601.000.

Kolc, Jaroslav F.. *See*—
Swerdloff, Michael D.; Van Der Puy, Michael; Kolc, Jaroslav F.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,539,037, Cl. 71-28.000.

Koller, Markus: *See*—
Sawatzki, Harry L.; Koller, Markus; and Schaedler, Hansjorg, 4,538,301, Cl. 2-2.000.

Kollross, Gunter. Process and apparatus for automated manufacture of link sausages having casings formed of synthetic tubular material. 4,538,326, Cl. 17-49.000.

Komeya, Katsutoshi; Tsuge, Akihiko; Inoue, Hiroshi; and Ohta, Hiroyasu, to Tokyo Shibaura Denki Kabushiki Kaisha. Highly heat-conductive ceramic material. 4,539,298, Cl. 501-89.000.

Komine, Yoshio, to Canon Kabushiki Kaisha. Portable video system. 4,539,601, Cl. 358-335.000.

Komori, Toshihisa: *See*—
Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, 4,538,665, Cl. 164-160.100.

Kondo, Mitsuru: *See*—
Takahashi, Shuichi; Kondo, Mitsuru; and Yuasa, Kazuhiro, 4,539,600, Cl. 358-282.000.

Konrad, Mathias; and Kampf, Klaus, to Jean Walterscheid GmbH. Overload clutch with vibration protection mechanism. 4,538,715, Cl. 192-56.00R.

Kopala, Peter S.: *See*—
Griffin, Thomas D.; and Kopala, Peter S., 4,539,650, Cl. 364-567.000.

Kopp GmbH International Pipeline Services: *See*—
Steinhaus, Harald; and Meiners, Detlef, 4,538,359, Cl. 34-21.000.

Koppensteiner, Werner, to Otis Elevator Company. Progressive safety. 4,538,706, Cl. 187-90.000.

Koppers Company, Inc.: *See*—
Carlson, John D.; Kifer, Edward W.; Wojtyna, Vincent J.; and Colton, James P., 4,539,338, Cl. 521-131.000.

Koppl, Georg; and Linhofer, Gerhard, to BBC Brown, Boveri & Company Limited. Coolable electrical component. 4,539,432, Cl. 174-15.00C.

Koster, William M.: *See*—
Dederich, Stanley S.; Schoenfelder, George A.; and Koster, William M., 4,539,556, Cl. 340-515.000.

Kostinko, John A., to J. M. Huber Corporation. Preparation of sodium silicate solutions. 4,539,191, Cl. 423-275.000.

Kotobuki Seihan Printing Co., Ltd.: *See*—
Kaneko, Sinobu; and Nakade, Hiroyuki, 4,539,647, Cl. 364-526.000.

Kottke, Louis E., to Acco Babcock Inc. Roll swage device. 4,538,440, Cl. 72-189.000.

Kovacs, Gyula: *See*—
Bodas, Janos; Bakay, Arpad; Papp, Istvan; Palfalvi, Gyorgy; and Kovacs, Gyula, 4,538,677, Cl. 165-146.000.

Kowal, Leonard J.; and Schwarz, Albert J., to Imperial Clevite Inc. High pressure, leakproof, blowout-proof tube fitting. 4,538,842, Cl. 285-354.000.

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Takagi, Mikio; Takasaki, Kanetake; and Koyama, Kenji, 4,539,068, Cl. 156-614.000.

Koyama, Takashi: *See*—
Asaka, Kazuo; and Koyama, Takashi, 4,539,197, Cl. 419-6.000.

Kozuki, Koichi; and Koike, Tatsuhiro, to Nippon Gakki Seizo Kabushiki Kaisha. Apparatus for printing out graphical patterns. 4,538,500, Cl. 84-462.000.

Kramler, Josef; Kuhn-Kuhnenfeld, Franz; and Gerber, Hans-Adolf, to Wacker-Chemitronic Gesellschaft Fur Elektronik-Grundstoffe m.b.H. Process for the manufacture of semiconductor wafers with a rear side having a gettering action. 4,539,050, Cl. 148-1.500.

Krass, Alvin: *See*—
Kelly, Hugh; and Krass, Alvin, 4,539,559, Cl. 340-573.000.

Krause, Dennis L., to AT&T Technologies, Inc. Film-type electrical substrate circuit device and method of forming the device. 4,539,434, Cl. 174-68.500.

Krebs, Ernst P., to Hoffmann-La Roche Inc. Polyene compounds. 4,539,154, Cl. 260-410.90N.

Krenz, Horst M., to Heath Company. Strain relief clip for electrical cable. 4,538,875, Cl. 339-103.00R.

Kretzschmann, Gunther, to Anasco Gesellschaft mit beschrankter Haftung. Artificial fireplace log. 4,539,011, Cl. 44-14.000.

Krijnen, Wilhelmus J.: *See*—
Bleeker, Jan J.; Booth, Martin; van Grieken, Madeline G. F. M.; Krijnen, Wilhelmus J.; and van Wijngaarden, Gerhard D., 4,539,126, Cl. 252-39.000.

Krishnan, Sivaram; and Sanderson, John R., to Mobay Chemical Corporation. Polymers prepared from 4,4'-bis(4-hydroxyphenyl thio)-biphenyls. 4,539,384, Cl. 528-79.000.

Kristiansen, Odd; Drabek, Jozef; and Fluck, Victor, to Ciba-Geigy Corporation. Phosphoryl-triazines. 4,539,314, Cl. 514-84.000.

Krogh, Egon: *See*—
Blohm, Knud; and Krogh, Egon, 4,538,717, Cl. 192-0.094.

Kromer, Philip F., III: *See*—
Chiu, Ran F.; Kromer, Philip F., III; Kao, Ming L.; and Parrish, Henry H., 4,539,689, Cl. 375-13.000.

Krones Ag Hermann Kronseder Maschinenfabrik: *See*—
Godecke, Paul; and Meichel, Otto, 4,538,945, Cl. 409-157.000.

Kropp, Helmut: *See*—
Kahan, Frederick M.; and Kropp, Helmut, 4,539,208, Cl. 514-192.000.

Krottinger, David L.; and Cabbiness, Dale K., to Conoco Inc. Automated sample analyzer for induction furnace analysis. 4,539,645, Cl. 364-478.000.

Kroy, Walter: *See*—
Dietrich, Klaus; and Kroy, Walter, 4,539,598, Cl. 358-213.000.

Krumholz, Freda. Computer teaching system. 4,538,993, Cl. 434-118.000.

Krutten, Viktor, to Fresenius AG. Union for medical instruments or pipes and a female half of such a union. 4,538,836, Cl. 285-24.000.

Kubo, Kenji: *See*—
Kami, Yozo; Minakawa, Masaaki; and Kubo, Kenji, 4,538,831, Cl. 280-666.000.

Kubota, Ltd.: *See*—
Nishihara, Hisakatsu; and Yoshimitsu, Arata, 4,538,668, Cl. 164-448.000.

Kubota, Nobunori: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,538,329, Cl. 19-244.000.

Kubota, Tetsumaru, to Olympus Optical Co., Ltd. Resectoscope. 4,538,610, Cl. 128-303.150.

Kuboyama, Keiji; Matsui, Takeki; and Kimura, Takeo, to Asahi Kasei Kogyo Kabushiki Kaisha. Indium-antimony complex crystal semiconductor and process for production thereof. 4,539,178, Cl. 420-555.000.

Kucera, William J.: *See*—
Dressel, William G.; and Kucera, William J., 4,538,357, Cl. 33-203.180.

Kuchenbecker, Morris W., to James River/Dixie-Northern, Inc. Carton with improved opening structure. 4,538,732, Cl. 206-613.000.

Kudo, Hisashi: *See*—
Fujita, Yuko; and Kudo, Hisashi, 4,539,086, Cl. 204-129.000.

Kudo, Mitsuhiro: *See*—
Yuito, Isamu; Shiiki, Kazuo; Saiki, Atsushi; Homma, Yoshio; Kumasaka, Noriyuki; Shiroishi, Yoshihiro; and Kudo, Mitsuhiro, 4,539,616, Cl. 360-125.000.

Kudo, Tetsuichi: *See*—
Miyauchi, Katsuki; Kudo, Tetsuichi; Minato, Osamu; Masuhara, Toshiaki; and Uetani, Yoshio, 4,539,660, Cl. 365-229.000.

Kuhfuss, Herbert F.: *See*—
Jackson, Winston J., Jr.; Kuhfuss, Herbert F.; and Watkins, Joseph J., 4,539,390, Cl. 528-303.000.

Kuhn-Kuhnenfeld, Franz: *See*—
Kramler, Josef; Kuhn-Kuhnenfeld, Franz; and Gerber, Hans-Adolf, 4,539,050, Cl. 148-1.500.

Kukes, Simon G.; and Banks, Robert L., to Phillips Petroleum Company. Olefin metathesis catalyst. 4,539,308, Cl. 502-243.000.

Kumasaka, Noriyuki: *See*—
Yuito, Isamu; Shiiki, Kazuo; Saiki, Atsushi; Homma, Yoshio; Kumasaka, Noriyuki; Shiroishi, Yoshihiro; and Kudo, Mitsuhiro, 4,539,616, Cl. 360-125.000.

Kuonen, Frederick L.: *See*—
Updike, Stanley H.; Michaels, William A.; and Kuonen, Frederick L., 4,538,558, Cl. 123-90.300.

Kuplas, Harbey, to Hoover Company, The. Suction cleaner bag. 4,539,026, Cl. 55-376.000.

Kurafuji, Setsuo, to Fujitsu Limited. Semiconductor device for use in a sense amplifier. 4,539,494, Cl. 307-530.000.

Kuraray Co., Ltd.: *See*—
Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, 4,539,382, Cl. 526-276.000.

Kuroda, Yoshio: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,539,155, Cl. 260-112.50R.

Kuromaru, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Anti-short bonding pad structure. 4,539,582, Cl. 357-71.000.

Kurosaki Refractories Co., Ltd.: *See*—
Kaneko, Toshiaki; Takita, Ichiro; and Shikano, Hiroshi, 4,539,301, Cl. 501-99.000.

Kurusu, Toshiro; and Ishii, Hakumi, to Toyota Jidosha Kabushiki Kaisha. Tiltable steering shaft assembly for automotive vehicles. 4,538,477, Cl. 74-493.000.

Kurz, Wolf-Dieter; Hanke, Hans; and Braatz, Andreas, to Daimler-Benz Aktiengesellschaft. Mode of control of the heating capacity of a hydrodynamic brake. 4,538,553, Cl. 123-41.130.

Kusakawa, Yukio, to Nippondenso Co., Ltd. Motor driven fuel pump. 4,538,968, Cl. 417-368.000.

Kutscher, Fritz; and Zschocke, Christian, to Bauakademie der Deutschen Demokratischen Republik. Fluid-cushion supporting arrangement for horizontal conveyance. 4,538,699, Cl. 180-125.000.

Kuttner, Thomas: *See*—
Buck, Rainer; Engel, Gerhard; Kuttner, Thomas; Sautter, Wilfried; and Wessel, Wolf, 4,538,571, Cl. 123-357.000.
Kuzlik, Mark S.: *See*—
Son, Adelina J.; and Kuzlik, Mark S., 4,539,122, Cl. 252-8.55R.
Kuzuna, Seiji: *See*—
Nohara, Akira; and Kuzuna, Seiji, 4,539,326, Cl. 514-285.000.
Kwasnicki, J. Michael: *See*—
Reid, Michael J.; Kwasnicki, J. Michael; and Cheung, Nai-Kong V., 4,539,292, Cl. 435-7.000.
Kwiatkowski, Joachim: *See*—
Jochemczyk, Claus; Kwiatkowski, Joachim; and Herrmann, Klaus, 4,538,927, Cl. 374-163.000.
L & C. Steinmuller GmbH: *See*—
Premel, Ulrich; and Becker, Jorgen, 4,538,676, Cl. 165-145.000.
La Bate, Michael D. Device for introducing gas into molten metal in controlled streams. 4,538,795, Cl. 266-220.000.
LaBate, Micheal D. Method and apparatus for pouring molten metal in a neutral atmosphere. 4,538,670, Cl. 164-475.000.
Laboratorios Vita, S.A.: *See*—
Caldero Ges, Jose M.; and Duena, Antonio P., 4,539,331, Cl. 514-400.000.
Laderman, Arnold J.; and Bergthold, Frederick M., Jr., to United States of America, Air Force. Laser beam duct pressure controller system. 4,538,635, Cl. 137-114.000.
La Fiandra, Carlo, to Perkin-Elmer Corporation, The. X-Ray lithography system. 4,539,695, Cl. 378-34.000.
Lagier, Jean-Pierre: *See*—
Figlarz, Michel; Fievet, Fernand; and Lagier, Jean-Pierre, 4,539,041, Cl. 75-0.50A.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Le Diouron, Raymond, 4,538,423, Cl. 62-222.000.
Lambrecht, Gerhard: *See*—
Mayr, Hermann; Kahmann, Albrecht; Lambrecht, Gerhard; Heinbockel, Wolfgang; Siewert, Wolfgang; and Maier, Josef, 4,538,765, Cl. 241-21.000.
Lammert, James E.; Nichols, Charles E.; and Howard, John R., to Drackett Company, The. Push broom assembly. 4,538,318, Cl. 15-171.000.
Landa, Benzion; and Sagiv, Oded, to Savin Corporation. Catalytic fixer-dryer for liquid developed electrophotocopiers. 4,538,899, Cl. 355-10.000.
Landphair, Donald K.; and Doering, James P., to Deere & Company. Socket casting with a cast-in ball and method of casting. 4,539,246, Cl. 428-131.000.
Lane, John N., to Xerox Corporation. Multiple magnification mode copying apparatus. 4,538,903, Cl. 355-57.000.
Lane, John N., to Xerox Corporation. Multiple magnification mode copying apparatus. 4,538,904, Cl. 355-57.000.
Lang, Gerard; Maignan, Jean; Leveque, Jean-Luc; and Rasseneur, Laurent, to L'Oreal. Humectant compositions containing thiamorpholinone or a derivative thereof. 4,539,320, Cl. 514-222.000.
Langenfeld, Joseph W.; and Westendorf, Neal W., to Westendorf Mfg. Co., Ltd. Adjustable tower for front end tractor loaders. 4,538,955, Cl. 414-686.000.
Langford, Nathaniel P., to Minnesota Mining and Manufacturing Company. Leather treatment. 4,539,006, Cl. 8-94.10R.
Lapshansky, John F. Pivotable multiple socket. 4,538,847, Cl. 294-51.000.
Laser Precision Corporation: *See*—
Doyle, Walter M., 4,538,910, Cl. 356-346.000.
Lassmann, Manfred: *See*—
Baltsch, Erwin; Gobbels, Heinz-Dieter; Grecksch, Hans; Lassmann, Manfred; Raasch, Hans; and Schlosser, Helmut, 4,538,408, Cl. 57-263.000.
Latimer, John; and Fortune, Neil, to Mauri Brothers & Thomson (N.Z.) Limited. Conveyors. 4,538,510, Cl. 99-459.000.
Latszereszeti Eszkozok Gyara: *See*—
Pojbics, Jeno ; and Magyar, Ferenc, 4,539,087, Cl. 204-146.000.
Lattime, Richard R.: *See*—
Ambler, Michael R.; Lattime, Richard R.; and Wanca, Edward, 4,539,346, Cl. 523-332.000.
Laurel Bank Machine Co., Ltd.: *See*—
Oka, Yoshinobu, 4,539,702, Cl. 382-7.000.
Lave , Daniel: *See*—
Fabre, Jean-Louis; Farge, Daniel; James, Claude; and Lave , Daniel, 4,539,400, Cl. 544-47.000.
Lavigne, William J., Jr.: *See*—
Mount, Gordon L.; and Lavigne, William J., Jr., 4,538,422, Cl. 62-201.000.
Law, Kock-Yee: *See*—
Barbetta, Angello J.; Gruber, Robert J.; Isganitis, Louis V.; Law, Kock-Yee; Lin, John W.; Koch, Ronald J.; and Dunn, Steven T., 4,539,284, Cl. 430-110.000.
Lawrence Brothers, Inc.: *See*—
Johnson, Larry, 4,538,323, Cl. 16-98.000.
Lawrence, James: *See*—
Broome, Lloyd N.; and Lawrence, James, 4,539,574, Cl. 346-139.00R.
Lawrence, John P.; and Felfeli, Manoucher, to DeMarco Energy Systems, Inc. Heat pump. 4,538,418, Cl. 62-79.000.
Lawson, Dale W. R.: *See*—
Beggs, Stanley L.; Riel, Frank J.; and Lawson, Dale W. R., 4,539,244, Cl. 428-116.000.
Lawson, Lonnie B., Jr.: *See*—
Miller, Jonathan; Wacek, Rudolph W.; Berfield, Robert C.; Meland, Ronald F.; Crevling, Robert L., Jr.; and Lawson, Lonnie B., Jr., 4,538,971, Cl. 417-423.00A.
Lazarus, Arnold. Method of extending useful life of instrument strings. 4,539,228, Cl. 427-180.000.
Le, Quang N.: *See*—
Oleck, Stephen M.; Le, Quang N.; and Neuman, Daniel J., 4,539,101, Cl. 208-251.00H.
Le, Thu T.: *See*—
Marshall, Robert J.; and Le, Thu T., 4,539,504, Cl. 313-113.000.
Lebecque, Maurice. Potential energy accumulating system using multiple types of energy input. 4,538,415, Cl. 60-639.000.
Lebesherais, Gerard: *See*—
Boudon, Gerard; Mollier, Pierre; and Lebesherais, Gerard, 4,539,680, Cl. 370-100.000.
Lebizay, Gerald: *See*—
Ambroise, Modeste; Demange, Michel; Lebizay, Gerald; Munier, Jean-Marie; and Peyronnenc, Michel H. P., 4,539,678, Cl. 370-86.000.
Leblanc, Jean: *See*—
Straubel, Max; Eisele, Hermann; Leblanc, Jean; and Pigeroulet, Jean, 4,538,580, Cl. 123-494.000.
Le Coq, Gerard; and Soussaline, Francoise, to Commissariat a l'Energie Atomique. Process for obtaining three-dimensional images of an object and its application to the tomography of an organ. 4,539,639, Cl. 364-414.000.
Ledet, Stephen J., Jr.: *See*—
Bergeron, Hervin J., Jr., 4,538,507, Cl. 98-31.500.
Ledgerwood, Harry J., to Plessey Incorporated. Pipe joint coupling. 4,538,839, Cl. 285-236.000.
Le Diouron, Raymond, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Cooling apparatus and cooling trap including such an apparatus. 4,538,423, Cl. 62-222.000.
Lee, Kien-yin, to United States of America, Energy. Preparation of ethylenediamine dinitrate. 4,539,430, Cl. 564-511.000.
Lee, Minyoung: *See*—
Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., 4,539,141, Cl. 252-516.000.
Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., 4,539,299, Cl. 501-96.000.
Lee, Raymond; Okey, David W.; and Ferro, Gregory A., to IMI-Tech Corporation. Polyimide foam prepared from amino terminated butadiene acrylonitrile reactant. 4,539,342, Cl. 521-189.000.
Lee, Shou-Yuan: *See*—
Cheng, Cheng-Yi; Lee, Shou-Yuan; Chen, Kwang-Ming; and Hong, Won-Doon, 4,539,380, Cl. 526-78.000.
Leftin, Harry P.; and Patil, Kashinath Z., to M. W. Kellogg Company, The. Steam reforming catalyst. 4,539,310, Cl. 502-303.000.
Lehnert, Stanley E., to Zenith Electronics Corporation. Pulse wave to parabola wave converter. 4,539,488, Cl. 307-261.000.
Lehto, Altti: *See*—
Fornas, Mikael; Sipila , Raimo; and Lehto, Altti, 4,539,027, Cl. 55-378.000.
Leipold, Kurt: *See*—
Puls, Bernhard; Gruber, Hermann; Leipold, Kurt; Schonberger, Richard; Kizak, Ulrich; and Huttereer, Max, 4,539,442, Cl. 179-115.5VC.
Leivestad, Ole E., to Spider Staging, Inc. Method and apparatus for moving a platform into a suspended outboard position. 4,538,705, Cl. 182-142.000.
LeMahieu, Ronald A., to Hoffmann-La Roche Inc. Naphthalenyloxy substituted carboxylic acids. 4,539,419, Cl. 560-053.000.
Le Marer, Rene ; and Delebecque, Robert P. Front surface grinding machine and method. 4,538,383, Cl. 51-124.00R.
Lemarie, Romeo, to Paraid Limited. Aid for propelling wheeled vehicles. 4,538,826, Cl. 280-242.0WC.
Lemforder Metallwaren AG: *See*—
Burmeister, Joachim; Buhl, Reinhard; and Westphal, Paul, 4,538,935, Cl. 403-140.000.
Lemkin, Jack L., to O. M. Scott & Sons Company, The. Pattern controlled sprinkler apparatus. 4,538,762, Cl. 239-232.000.
Lenz, Michael, to Siemens Aktiengesellschaft. Semiconductor amplifier circuit. 4,539,529, Cl. 330-295.000.
Leonard Automatics, Inc.: *See*—
Frushtick, Leonard, 4,538,370, Cl. 38-42.000.
Leonard, David L.: *See*—
Rosman, Irwin E.; and Leonard, David L., 4,538,749, Cl. 222-386.500.
Lerch, Orville L., to CLEARING, a division of U.S. Industries, Inc. Adjustable hydraulic die clamp. 4,538,797, Cl. 269-27.000.
Lerman, Max. Cervical collar. 4,538,597, Cl. 128-75.000.
Leroux, Didier: *See*—
Paradowski, Henri; and Leroux, Didier, 4,539,028, Cl. 62-9.000.
Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 5-(2-Substituted-4-thiazolyl)-6-alkyl-2(1H)-pyridinones and cardiotonic use thereof. 4,539,327, Cl. 514-342.000.
L'Esperance, Francis A., Jr. Method and apparatus for removing cataractous lens tissue by laser radiation. 4,538,608, Cl. 128-303.100.
Levenberg, Nat. Chair for handicapped persons. 4,538,853, Cl. 297-339.000.
Leveque, Jean-Luc: *See*—
Lang, Gerard; Maignan, Jean; Leveque, Jean-Luc; and Rasseneur, Laurent, 4,539,320, Cl. 514-222.000.

Lever Brothers Company: *See—*
Boskamp, Jelles V., 4,539,133, Cl. 252-109.000.
de Ridder, Johannes J. M.; Hollingsworth, Michael W.; and Robb, Ian D., 4,539,144, Cl. 252-526.000.
Garner-Gray, Peter F., 4,539,131, Cl. 252-99.000.
Oakes, John, 4,539,132, Cl. 252-95.000.

Levy, Uri: *See—*
Gordon, Eugene I.; and Levy, Uri, 4,539,687, Cl. 372-43.000.

Lewis, Arthur M.; and Scudo, Aldo, to Exxon Research and Engineering Co. Hot melt ink jet having non-spill reservoir. 4,539,568, Cl. 346-1.100.

Lewis, Elmer R. Golf bag security device. 4,538,728, Cl. 206-315.300.

Leyendecker, William R.; and Rapoport, Morris, to Du Pont de Nemours, E. I., and Company. Recovery of zerovalent nickel complexes. 4,539,302, Cl. 502-24.000.

Li, Chiu-shan. Set of plug with L-shaped pins and corresponding socket. 4,538,871, Cl. 339-75.00M.

Li, Hsueh M.: *See—*
Chung, James Y. J.; Jones, Jesse D.; and Li, Hsueh M., 4,539,352, Cl. 524-109.000.

Li, Stephen: *See—*
Bissot, Thomas C.; and Li, Stephen, 4,539,084, Cl. 204-98.000.

Licari, Vito: *See—*
Licari, Yaffa; and Licari, Vito, 4,538,739, Cl. 211-189.000.

Licari, Yaffa; and Licari, Vito. Magazine rack. 4,538,739, Cl. 211-189.000.

Lichti, Wayne P.; and Hofstatter, Alfred F., to Metal Alloys Inc. Method of object consolidation employing graphite particulate. 4,539,175, Cl. 419-49.000.

Lieberman, Gilbert R. Lamp shade and method. 4,539,631, Cl. 362-351.000.

Liet, Cornelis H.; and Liet, Fredericus, to Trioliet-Mullos Silo Nederland B.V. Conveyor for conveying silage or the like material. 4,538,949, Cl. 414-24.600.

Liet, Fredericus: *See—*
Liet, Cornelis H.; and Liet, Fredericus, 4,538,949, Cl. 414-24.600.

Limousin, Jean-Louis, to Pet, Incorporated. Apparatus for transferring articles between conveyors. 4,538,720, Cl. 198-416.000.

Lin, John W.: *See—*
Barbetta, Angello J.; Gruber, Robert J.; Isganitis, Louis V.; Law, Kock-Yee; Lin, John W.; Koch, Ronald J.; and Dunn, Steven T., 4,539,284, Cl. 430-110.000.

Lincoln Manufacturing Company, Inc.: *See—*
Gigandet, Richard W., 4,539,469, Cl. 219-412.000.

Lindemann, Peer. Orthosis device for congenital metatarsus. 4,538,599, Cl. 128-80.00A.

Lindner, Robert W.; and Vallese, Lucio M., deceased (Vallese, Eleanor R., executrix), to Electrophysics Corporation. Image stabilized rotational modulator for pyroelectric imaging devices. 4,539,589, Cl. 358-113.000.

Ling, Han-Chin: *See—*
King, Ming L.; Chiang, Chin-Chih; Ling, Han-Chin; Ochiai, Masahito; Fujita, Eiichi; and McPhail, Andrew T., 4,539,414, Cl. 549-458.000.

Linhofer, Gerhard: *See—*
Koppl, Georg; and Linhofer, Gerhard, 4,539,432, Cl. 174-15.00C.

Lippert, Thomas E.: *See—*
Ciliberti, David F.; and Lippert, Thomas E., 4,539,025, Cl. 55-302.000.

Lipson, Melvin A.; Derrico, Gene A.; Tark, Sung Y.; and Yamazaki, Toshio, to Dynachem Corporation. Flexible, fast processing, photopolymerizable composition. 4,539,286, Cl. 430-277.000.

Littau, Eugene G., to Littau Harvester, Inc. Mechanical berry harvester having row-width-adjustable beater. 4,538,406, Cl. 56-330.000.

Littau Harvester, Inc.: *See—*
Littau, Eugene G., 4,538,406, Cl. 56-330.000.

Litton Systems, Inc.: *See—*
Grzelka, Andrew; and Hodges, Davis R., 4,538,938, Cl. 405-198.000.

Liu, Ping Y., to General Electric Company. Polycarbonate compositions. 4,539,358, Cl. 524-285.000.

Livingston, Duane P. Drum beating apparatus. 4,538,499, Cl. 84-422.00R.

Lo, Yuan-Chang, to International Business Machines Corp. Multiple access data communication system. 4,539,677, Cl. 370-85.000.

Lobo, Claude; and Burger, Peter, to Ford Motor Company. Draft deflectors for motor cars. 4,538,852, Cl. 296-91.000.

Lockheed Corporation: *See—*
Hartog, Jan J.; Bellin, Jack L.; Knollman, Gilbert C.; and Jonath, Arthur D., 4,538,462, Cl. 73-577.000.

Logan, John S. B., Jr.: *See—*
Anctil, Stephen N.; Gleason, Robert F.; Hadfield, Don A.; Logan, John S. B., Jr.; and Richardson, Alfred G., 4,538,881, Cl. 350-96.230.

Lombardi, Claudio, to Fiat Auto S.p.A. Supercharged internal combustion engine with a cylinder head having four valves per cylinder. 4,538,574, Cl. 123-432.000.

Lommerzheim, Werner: *See—*
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, 4,539,016, Cl. 48-197.00R.

Lonati, Francesco, to Lonati S.p.A. Circular knitting machine incorporating a device for renewing a needle selection at at least one yarn feed. 4,538,431, Cl. 66-224.000.

Lonati S.p.A.: *See—*
Lonati, Francesco, 4,538,431, Cl. 66-224.000.

Long, John V.; and Gagliani, John. Modified polyimide/polyimide-amide foams and methods of making same. 4,539,336, Cl. 521-77.000.

Looker, Robert. Cargo container. 4,538,663, Cl. 160-368.00R.

Lord, Richard G., to Carrier Corporation. Refrigeration unit controls. 4,538,419, Cl. 62-129.000.

L'Oreal: *See—*
Lang, Gerard; Maignan, Jean; Leveque, Jean-Luc; and Rasseneur, Laurent, 4,539,320, Cl. 514-222.000.

Lorenz, Dieter, to Siemens Aktiengesellschaft. Disconnect switch. 4,539,449, Cl. 200-146.00R.

Lorenz, Dieter; and Rehaag, Benno, to Siemens Aktiengesellschaft. Disconnect switch. 4,539,450, Cl. 200-148.00F.

Lotsko, Catherine A.: *See—*
Anderson, Herbert R., Jr.; Araps, Constance J.; and Lotsko, Catherine A., 4,539,222, Cl. 427-88.000.

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Klotz, Willi, 4,539,545, Cl. 337-380.000.
Mifune, Hiroyuki: *See*—
Inoue, Nobuaki; Mifune, Hiroyuki; and Nakamura, Koki, 4,539,291, Cl. 430-597.000.
Migliori, Albert: *See*—
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Mihayashi, Keiji: *See*—
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Miki, Yasuhiro: *See*—
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Milbrandt, Thomas N.: *See*—
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Miles Laboratories, Inc.: *See*—
Johnson, Leighton C.; and King, James S., Jr., 4,539,182, Cl. 422-99.000.
Miller, Coleman J.; and Barron, Robert R., to Westinghouse Electric Corp. Four port phase shifter. 4,539,535, Cl. 333-164.000.

Miller, Jonathan; Wacek, Rudolph W.; Berfield, Robert C.; Meland, Ronald F.; Crevling, Robert L., Jr.; and Lawson, Lonnie B., Jr., to Shop-Vac Corporation. Assembly of tank lid and fan means of a wet/dry vacuum. 4,538,971, Cl. 417-423.00A.

Miller, Kevin P.: *See—*
Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., 4,539,209, Cl. 426-3.000.

Miller, Philip N. Glazing system. 4,539,243, Cl. 428-99.000.

Miller, Robert N.: *See—*
Sunder, Swaminathan; and Miller, Robert N., 4,539,094, Cl. 208-8.0LE.
Sunder, Swaminathan; and Miller, Robert N., 4,539,095, Cl. 208-8.0LE.

Miller, Thomas P., to Textron, Inc. Capacitive discharge ignition with long spark duration. 4,538,586, Cl. 123-620.000.

Milliken Research Corporation: *See—*
Bishop, Lewis A., 4,538,432, Cl. 68-5.00C.

Milner, Peter H., to Beecham Group p.l.c. β-Lactam antibacterial agents. 4,539,149, Cl. 260-239.100.

Minakawa, Masaaki: *See—*
Kami, Yozo; Minakawa, Masaaki; and Kubo, Kenji, 4,538,831, Cl. 280-666.000.

Minard, Everett S., to Elmar Industries, Inc. Valve mechanism for can filling machines. 4,538,788, Cl. 251-107.000.

Minato, Osamu: *See—*
Miyauchi, Katsuki; Kudo, Tetsuichi; Minato, Osamu; Masuhara, Toshiaki; and Uetani, Yoshio, 4,539,660, Cl. 365-229.000.

Mine, Keiji: *See—*
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Minemura, Norihiro: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
Drake, Gerald E., 4,538,920, Cl. 366-177.000.
Hansen, Dennis D., 4,539,345, Cl. 523-219.000.
Langford, Nathaniel P., 4,539,006, Cl. 8-94.10R.
Robbins, William B.; Willson, Richard F.; and Freese, Robert P., 4,539,572, Cl. 346-135.100.
Shipman, Gene H., 4,539,256, Cl. 428-315.500.

Minolta Camera Kabushiki Kaisha: *See—*
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Mishima, Fumiyuki: *See—*
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Mita Industrial Co., Ltd.: *See—*
Osaka, Haruya; Maekawa, Takashi; and Nakajima, Yoshihiro, 4,538,897, Cl. 355-3.0DD.

Mitamura, Shuichi: *See—*
Tsuchihashi, Gen-Ichi; Mitamura, Shuichi; and Kitajima, Koji, 4,539,420, Cl. 560-056.000.

Mitchell, Terry L., to Jer Manufacturing, Inc. Folding truss. 4,538,393, Cl. 52-641.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Ishii, Tetsuo, 4,539,487, Cl. 307-44.000.
Mori, Teijiro; Wada, Yuichi; Nishisako, Shizutaka; Tazawa, Hiroaki; and Masuda, Shigeru, 4,539,451, Cl. 200-147.00R.
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Ohishi, Kenji; and Hashimoto, Yasuhiko, 4,538,425, Cl. 62-280.000.
Suzuki, Mamoru; and Tanaka, Hiromoto, 4,538,994, Cl. 434-219.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Hiramatsu, Takeo, 4,538,482, Cl. 74-869.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Shinoda, Naoharu; Tatani, Atsushi; Inoue, Kenji; and Okino, Susumu, 4,539,190, Cl. 423-240.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Sugisawa, Taijiro; and Tanase, Teruyoshi, 4,539,251, Cl. 428-216.000.

Mitsui Kinzoku Kogyo K. K.: *See—*
Yamada, Shinjiro, 4,538,845, Cl. 292-216.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; and Shirakawa, Isao, 4,539,150, Cl. 260-239.30B.
Katakami, Tsutomu; Fukazawa, Nobuyuki; and Iizuka, Hajime, 4,539,151, Cl. 260-239.30B.

Mittleman, Herbert, to Trimedyne, Inc. Medication mixing and sequential administration device. 4,538,918, Cl. 366-160.000.

Miyahara, Junji; Nakamura, Takashi; and Takahashi, Kenji, to Fuji Photo Film Co. Ltd. Phosphor. 4,539,138, Cl. 252-301.40H.

Miyakawa, Tsutomu; Yamane, Junji; Takagi, Masahiro; Arai, Tomoyoshi; Tanaka, Haruhiko; Morita, Yuji; and Sakurai, Satoshi, to Pioneer Electric Corporation. Front-loading record player. 4,539,669, Cl. 369-75.200.

Miyauchi, Katsuki; Kudo, Tetsuichi; Minato, Osamu; Masuhara, Toshiaki; and Uetani, Yoshio, to Hitachi, Ltd.; and Hitachi Maxell, Ltd. Semiconductor integrated circuit. 4,539,660, Cl. 365-229.000.

Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Hasegawa, Teruyuki; Nimura, Yoichi; and Hiraga, Noriyuki, to Nippon Kokan Kabushiki Kaisha. Bottom-blown gas blowing nozzle. 4,539,043, Cl. 266-265.000.

Miyazaki, Koichi; and Aoki, Masayuki, to Kabushiki Kaisha Toshiba. Control circuit for a microwave oven. 4,539,453, Cl. 219-10.55C.

Miyazaki, Manabu: *See—*
Amemori, Koichi; Kawabe, Toshihiko; and Miyazaki, Manabu, 4,538,561, Cl. 123-90.440.

Miyazaki, Takahiro, to Sony Corporation. Magnetic recording medium. 4,539,266, Cl. 428-695.000.

Mizoguchi, Kiyohisa: *See—*
Sakai, Takayoshi; Mizoguchi, Kiyohisa; and Hayakawa, Masazumi, 4,539,634, Cl. 364-167.000.

Mizumura, Motoo; and Wada, Kenzo, to Nippon Electric Co., Ltd. Transistorized microwave oscillator of oscillation frequency multiplying type. 4,539,530, Cl. 331-117.0FE.

Mizuno, Yoshikazu; and Ikuma, Akira, to Nippondenso Co., Ltd. Fail-safe speed control system for motor vehicles. 4,539,642, Cl. 364-426.000.

Mizutani, Hiroyuki; and Ochi, Kunihiko, to Aisin Seiki Kabushiki Kaisha. Indicator switch mechanism for automobile transfer gear units. 4,539,447, Cl. 200-61.910.

Mlynek, Daniel: *See—*
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Mobay Chemical Corporation: *See—*
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Dewhurst, John E.; Dormish, Jeffrey F.; and Pantone, Richard S., 4,539,157, Cl. 260-453.0SP.
Dewhurst, John E.; Dormish, Jeffrey F.; and Pantone, Richard S., 4,539,158, Cl. 260-453.0SP.
Krishnan, Sivaram; and Sanderson, John R., 4,539,384, Cl. 528-79.000.

Mobil Oil Corporation: *See—*
Boston, William G.; and Strong, Robert T., 4,539,102, Cl. 209-38.000.
Clayton, William J., 4,539,237, Cl. 428-40.000.
Gunesin, Binnur Z., 4,539,371, Cl. 525-98.000.
Heiba, El-Ahmadi I.; and Williams, Albert L., 4,539,127, Cl. 252-47.500.
Oleck, Stephen M.; Le, Quang N.; and Neuman, Daniel J., 4,539,101, Cl. 208-251.00H.
Rudnick, Leslie R., 4,539,096, Cl. 208-11.00R.
Valyocsik, Ernest W., 4,539,193, Cl. 423-328.000.

Moddel, Garret R.; and Gibbons, James F., to Sera Solar Corporation. Pulse anneal method for solar cell. 4,539,431, Cl. 136-258.000.

Mohr, Glenn R., to Continental Can Company, Inc. Induction heating system and method of bonding container end unit to body utilizing the same. 4,539,456, Cl. 219-10.690.

Molcho, Jonathan: *See—*
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Molex Incorporated: *See—*
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Dambach, Philip J.; and Berg, B. Alan, 4,538,874, Cl. 339-99.00R.
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Molins PLC: *See—*
Simmons, Albert, 4,538,453, Cl. 73-73.000.

Moll, Manfred: *See—*
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Mollier, Pierre: *See—*
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Moncada, Salvador, to Burroughs Wellcome Co. Prostacyclin, methods of using and method of making. 4,539,333, Cl. 514-469.000.

Montague, Herbert R.: *See—*
Delaney, Sean; and Montague, Herbert R., 4,539,617, Cl. 361-58.000.

Monterey Manufacturing Co.: *See—*
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Mookherjee, Braja D.: *See—*
Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., 4,539,209, Cl. 426-3.000.

Moolenaar, Antonie J.: *See—*
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Mooney Chemicals, Inc.: *See—*
Collins, Albert V.; and Asmus, Richard W., 4,539,235, Cl. 427-440.000.

Moore, Edgar F., III. Embroidery frame press. 4,538,335, Cl. 29-251.000.

Moore, Eugene W., to Willett International Limited. Stackable fluid dispensing apparatus. 4,539,570, Cl. 346-75.000.

Morette's Limited: *See—*
Wilson, Ross E., 4,538,854, Cl. 297-345.000.

Morgan, Louis W. Plasma oxygen permeability meter. 4,539,092, Cl. 204-415.000.

Morghen, Manfred, to General Dynamics Corporation/Convair Div. Removable and replaceable indexing and locating tooling component. 4,538,355, Cl. 33-180.00R.

Mori, Kenjiro: *See—*
Sako, Kazuaki; and Mori, Kenjiro, 4,539,563, Cl. 340-735.000.

Mori, Kiyoshi; and Nakagawa, Masao, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Expandable thermoplastic resin particles and process for preparing the same. 4,539,335, Cl. 521-60.000.

Mori, Teijiro; Wada, Yuichi; Nishisako, Shizutaka; Tazawa, Hiroaki; and Masuda, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Switch. 4,539,451, Cl. 200-147.00R.

Morillon, Theodore, to Etablissements Morillon. Extracting screw apparatus. 4,538,505, Cl. 91-518.000.
Morimoto, Junichi; Kawamura, Fumio; Watanabe, Akira; Suzuki, Yoshio; and Kawamura, Masamichi, to Tomoegawa Paper Manufacturing Company Limited. Electrophotographic photoconductive elements. 4,539,282, Cl. 430-59.000.
Morimoto, Kiyoshi; and Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Amorphous film of transition element-silicon compound. 4,539,054, Cl. 148-403.000.
Morimoto, Yoshiro: *See*—
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Morin, Rolland L. Paint filter. 4,539,116, Cl. 210-445.000.
Morio, Klaus: *See*—
Dantlgraber. Jorg; and Morio, Klaus, 4,538,965, Cl. 417-273.000.
Morishita, Mitsuharu; Yokota, Mitsuyoshi; and Matsumoto, Akio, to Mitsubishi Denki Kabushiki Kaisha. Vehicular direct-current three-wire electric system. 4,539,515, Cl. 320-17.000.
Morita, Yuji: *See*—
Miyakawa, Tsutomu; Yamane, Junji; Takagi, Masahiro; Arai, Tomoyoshi; Tanaka, Haruhiko; Morita, Yuji; and Sakurai, Satoshi, 4,539,669, Cl. 369-75.200.
Moriya, Kouichi; and Iwata, Kouki, to Diesel Kiki Co., Ltd. Fuel supply control system. 4,538,579, Cl. 123-492.000.
Moriya, Mitsuro: *See*—
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Morton, Roger H. Trap for marine animals. 4,538,376, Cl. 43-100.000.
Motoren- und Turbinen-Union Munchen GmbH: *See*—
Betz, Wolfgang; and Huther, Werner, 4,539,231, Cl. 427-255.000.
Motorola, Inc.: *See*—
Bertiger, Bary R., 4,538,757, Cl. 228-180.100.
Currier, David W., 4,539,621, Cl. 361-386.000.
Goode, Steven H., 4,539,524, Cl. 329-50.000.
Kloker, Kevin L., 4,539,684, Cl. 371-46.000.
Vaughn, Herchel A., 4,539,489, Cl. 307-290.000.
Mount, Gordon L.; and Lavigne, William J., Jr., to Carrier Corporation. Method and control system for limiting compressor capacity in a refrigeration system upon a recycle start. 4,538,422, Cl. 62-201.000.
Mouzin, Gilbert; Cousse, Henri; and Vilain, Pol, to Pierre Fabre S.A. Preparation of 3-amino-1-[(1,4-benzodioxan)-2-yl-methoxy]-2-propanols. 4,539,413, Cl. 549-366.000.
Moyer, John A.: *See*—
Stack, Gary P.; and Moyer, John A., 4,539,407, Cl. 546-87.000.
MTU- Motoren- und Turbinen-Union Friedrichshafen GmbH: *See*—
Schier, Karl; and Wolters, Gerd-Michael, 4,538,584, Cl. 123-559.000.
Mueller, Herbert; and Voges, Dieter, to BASF Aktiengesellschaft. Preparation of 3-hydroxytetrahydrofuran. 4,539,415, Cl. 549-475.000.
Mugford, Bernadette. Child's overshoe. 4,538,368, Cl. 36-112.000.
Mugford, David B.; and Guidicianne, Sidney J. Weight device for athletic racket. 4,538,812, Cl. 273-73.00R.
Mukai, Nakashiro: *See*—
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Mukainakano, Masato: *See*—
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Mulder, Berend J.; and van Heusden, Sybrandus, to U.S. Philips Corporation. Method of producing a low-pressure mercury vapor discharge lamp. 4,539,508, Cl. 313-546.000.
Mullan, Noel A.: *See*—
Newsome, Peter M.; Mullan, Noel A.; and Marshall, John P., 4,539,319, Cl. 514-222.000.
Muller, Guy L.; Fraioli, Daniel F.; and Oulie, Michel B., to Equipements Automobiles Marchal. Reactor for the fixation of a gas on a solid which may be used in particular for chlorination of windscreen wiper blades. 4,539,185, Cl. 422-233.000.
Muller, Paul E. Device for preventing the jamming of a disc mower by, or the breaking up, a layer of soil and plant matter. 4,538,402, Cl. 56-13.600.
Muller, Werner, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for evacuating and sealing rectangular packages. 4,538,399, Cl. 53-512.000.
Mullett, Donald H.: *See*—
Barnum, Thomas G.; Smart, William A., Jr.; and Mullett, Donald H., 4,538,307, Cl. 4-427.000.
Muma, Brian C., to Smith International, Inc. Screw ring cone retention apparatus and method for rock bits. 4,538,928, Cl. 384-96.000.
Mumaw, Clayton T., to Du Pont de Nemours, E. I., and Company. Process for pulsed flow, balanced double jet precipitation. 4,539,290, Cl. 430-569.000.
Munier, Jean-Marie: *See*—
Ambroise, Modeste; Demange, Michel; Lebizay, Gerald; Munier, Jean-Marie; and Peyronnenc, Michel H. P., 4,539,678, Cl. 370-86.000.
Munter, Ernst A., to Northern Telecom Limited. Digital automatic gain control circuit for PCM signals. 4,539,692, Cl. 375-98.000.
Murai, Kazuo; and Hasegawa, Yutaka, to Ricoh Company, Ltd. Image density control method. 4,539,279, Cl. 430-30.000.
Murasugi, Takashi: *See*—
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Murata Kikai Kabushiki Kaisha: *See*—
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Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,538,329, Cl. 19-244.000.
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,538,950, Cl. 414-222.000.
Murchison, Craig B., to Dow Chemical Company, The. Selective poisoning of Fischer-Tropsch catalysts. 4,539,334, Cl. 518-717.000.
Muroi, Akira; Sano, Masakatsu; Kamiya, Junichi; Okajima, Masao; and Inoue, Arifumi, to Nissan Motor Company, Limited. Vibration-absorbing system for an automotive vehicle. 4,538,697, Cl. 180-68.400.
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Muschelknautz, Edgar; Rink, Norbert; and Chalupka, Georg, to Bayer Aktiengesellschaft. Process and an apparatus for the division of melts. 4,539,029, Cl. 65-5.000.
Nabika, Kouichi: *See*—
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Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, to Toda Kogyo Corp. Barium ferrite particles and process for producing said particles. 4,539,129, Cl. 252-62.630.
Nagai, Shigeo, to Nisshin Kogyo Kabushiki Kaisha. Clutch brake arrangement for farm working machinery etc. 4,538,712, Cl. 192-18.00R.
Nagase, Yoshinori: *See*—
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Nagashima, Yoshimitsu, to Silver Seiko Ltd. Drive mechanism including a one-way spring clutch for a typewriter. 4,538,931, Cl. 400-185.000.
Nagata, Wataru: *See*—
Yamamoto, Sadao; Itani, Hikaru; Takahashi, Hiromi; Tsuji, Teruji; and Nagata, Wataru, 4,539,148, Cl. 260-239.00A.
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Nahas, Joseph J.: *See*—
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Nair, Ravindra: *See*—
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Nakade, Hiroyuki: *See*—
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Nakagawa, Katsuyuki. Handy torch. 4,538,984, Cl. 431-255.000.
Nakagawa, Koichiro: *See*—
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Nakagawa, Masao: *See*—
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Nakaguchi, Osamu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,539,155, Cl. 260-112.50R.
Nakai, Mamoru: *See*—
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Nakajima, Joe: *See*—
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Nakajima, Yoshihiro: *See*—
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Nakamura, Kenichi, to Hitachi, Ltd. Coil fitting system. 4,538,349, Cl. 29-736.000.
Nakamura, Kenji. Process for producing a re-sealable dispenser-container. 4,538,396, Cl. 53-412.000.
Nakamura, Koki: *See*—
Inoue, Nobuaki; Mifune, Hiroyuki; and Nakamura, Koki, 4,539,291, Cl. 430-597.000.
Nakamura, Takashi: *See*—
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Nakamura, Tsutomu: *See*—
Tamura, Yorikazu; Sadanobu, Jiro; and Nakamura, Tsutomu, 4,539,393, Cl. 528-348.000.
Nakano, Hiroshi: *See*—
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Nakano, Yoshiyuki; and Maida, Osamu, to Nippon Kogaku K.K. Motor driven camera. 4,538,893, Cl. 354-412.000.
Nakao, Shinroku; Saito, Hideo; Kato, Hitoshi; Ishii, Yoshiyasu; and Matsuda, Hiroaki, to Combi Co., Ltd. Baby carriage. 4,538,830, Cl. 280-647.000.
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Nakata, Kazuo; Maruo, Masatsuyo; and Asano, Kiyoshi, to Ishihara Sangyo Kaisha, Ltd. Process for producing magnetic powder and product. 4,539,261, Cl. 428-403.000.
Nakata, Shinichi, to Canon Kabushiki Kaisha. Clock device. 4,538,924, Cl. 368-74.000.
Nakaya, Hiroshi: *See*—
Saito, Yoshikazu; and Nakaya, Hiroshi, 4,539,486, Cl. 307-34.000.
Nakazawa, Masami: *See*—
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Namiki, Yasuomi, to Victor Company of Japan, Ltd. Tracking system in a rotary magnetic head type recording and/or reproducing apparatus. 4,539,604, Cl. 360-10.200.
Nara, Akio: *See*—
Izutani, Kouji; Shigeta, Isamu; Nara, Akio; and Hayashi, Hidetaka, 4,539,108, Cl. 210-104.000.
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Naschberger, Stefan, to Biochemie Gesellschaft m.b.H. Method of facilitating vegetation. 4,539,036, Cl. 71-11.000.
Nasu, Norio: *See*—
Ryoke, Katsumi; Masuyama, Kenichi; Yoneyama, Takashi; Nasu, Norio; and Tadokoro, Eiichi, 4,539,257, Cl. 428-323.000.
National Machinery Company, The: *See*—
Wisebaker, Robert E., 4,538,437, Cl. 72-345.000.
National Mine Service Company: *See*—
Thorne, Gary H., 4,538,941, Cl. 406-143.000.
National Set Screw: *See*—
Ewing, Peter D., 4,538,339, Cl. 29-510.000.
Naylor, Peter W.: *See*—
Phillips, Richard A.; Fletcher, Keith; and Naylor, Peter W., 4,539,468, Cl. 219-330.000.
NDM Corporation: *See*—
Patrick, Charles T., Jr., 4,538,612, Cl. 128-333.000.
Neil Brown Instrument Systems, Inc.: *See*—
Brown, Neil L., 4,539,525, Cl. 330-107.000.
Neisius, Karlheinz: *See*—
Merrem, Hans-Joachim; Neisius, Karlheinz; Klug, Rudolf; and Hartner, Hartmut, 4,539,288, Cl. 430-325.000.
Nelsen, Suzanne B., to GAF Corporation. Polyethylene terephthalate molding composition. 4,539,356, Cl. 524-166.000.
Nelson, Dale H.: *See*—
Davis, Paul C.; Jackson, Raymond G.; Nahas, Joseph J.; Nelson, Dale H.; Ong, DeWitt G.; and Wittman, Brian A., 4,539,552, Cl. 340-347.0DA.
Nelson, Lorne W., to Honeywell Inc. Defrost control system for a refrigeration heat pump apparatus. 4,538,420, Cl. 62-140.000.
Nemag B.V.: *See*—
Aberkrom, Peter, 4,538,848, Cl. 294-68.230.
Neomed Inc.: *See*—
Ecanow, Charles S.; and Ecanow, Bernard, 4,539,204, Cl. 514-6.000.
Neth, Norbert: *See*—
Meissner, Ruprecht; and Neth, Norbert, 4,539,309, Cl. 502-247.000.
Neuenschwander, Victor L. Wave activated generator. 4,539,485, Cl. 290-53.000.
Neuman, Daniel J.: *See*—
Oleck, Stephen M.; Le, Quang N.; and Neuman, Daniel J., 4,539,101, Cl. 208-251.00H.
New Ohto Co., Ltd.: *See*—
Senoh, Yasutaka, 4,539,444, Cl. 200-5.00R.
Newell Companies, Inc.: *See*—
Graves, Delbert E.; and Craft, George E., 4,539,239, Cl. 428-43.000.
Newsome, Peter M.; Mullan, Noel A.; and Marshall, John P., to Beecham Group p.l.c. Amidine derivatives. 4,539,319, Cl. 514-222.000.
NGK Insulators, Ltd.: *See*—
Matsuhisa, Tadaaki, 4,539,224, Cl. 427-190.000.
Matsui, Minoru; and Tsuno, Nobuo, 4,538,562, Cl. 123-90.510.
Nicholls, Robin P., to Raytheon Company. Memory system. 4,539,657, Cl. 365-45.000.
Nichols, Charles E.: *See*—
Lammert, James E.; Nichols, Charles E.; and Howard, John R., 4,538,318, Cl. 15-171.000.
Nickel, Horst; and Otten, Hans-Gunter, to Bayer Aktiengesellschaft. Dyestuff mixture. 4,539,009, Cl. 8-641.000.
Nickoloff, Alex M. Multiple use fixture assemblies for a cutting tool. 4,538,654, Cl. 144-1.00F.
Nieder, Elmar: *See*—
Engelbrecht, Eckart; Nieder, Elmar; and Keller, Arnold, 4,538,305, Cl. 623-20.000.
Nikaido, Masaya, to Jidosha Kiki Co., Ltd. Oil pump assembly. 4,538,966, Cl. 417-288.000.
Nike, Inc.: *See*—
Norton, Daniel E., 4,538,366, Cl. 36-32.00R.
Nikka Chemical Industry Co., Ltd.: *See*—
Ohzeki, Osamu; Shimakawa, Katsuhiko; and Mashino, Zenichi, 4,539,012, Cl. 44-51.000.
Nilsson, Bengt. Dressing device. 4,538,587, Cl. 125-11.0TP.
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Nimura, Yoichi: *See*—
Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Hasegawa, Teruyuki; Nimura, Yoichi; and Hiraga, Noriyuki, 4,539,043, Cl. 266-265.000.
Ninomiya, Masakazu: *See*—
Suzuki, Atsushi; Ninomiya, Masakazu; and Maeda, Katuya, 4,538,578, Cl. 123-478.000.
Nippon Electric Co., Ltd.: *See*—
Mizumura, Motoo; and Wada, Kenzo, 4,539,530, Cl. 331-117.0FE.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kozuki, Koichi; and Koike, Tatsuhiro, 4,538,500, Cl. 84-462.000.
Nippon Kogaku K.K.: *See*—
Ishizaka, Sunao; and Maida, Osamu, 4,538,890, Cl. 354-21.000.
Nakano, Yoshiyuki; and Maida, Osamu, 4,538,893, Cl. 354-412.000.
Wakabayashi, Tsutomu; and Furuya, Mikihito, 4,538,865, Cl. 339-17.00F.
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Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Hasegawa, Teruyuki; Nimura, Yoichi; and Hiraga, Noriyuki, 4,539,043, Cl. 266-265.000.
Nippon Printing Co., Ltd.: *See*—
Takeshita, Kazuhisa; and Takeda, Yasuo, 4,539,056, Cl. 156-183.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Fujii, Tsuneo; Inukai, Hiroshi; Deguchi, Takayuki; Amano, Toshihiko; Kakuchi, Masami; Asakawa, Hiroshi; and Kogure, Osamu, 4,539,250, Cl. 428-195.000.
Nippondenso Co., Ltd.: *See*—
Izutani, Kouji; Shigeta, Isamu; Nara, Akio; and Hayashi, Hidetaka, 4,539,108, Cl. 210-104.000.
Kusakawa, Yukio, 4,538,968, Cl. 417-368.000.
Mizuno, Yoshikazu; and Ikuma, Akira, 4,539,642, Cl. 364-426.000.
Suzuki, Atsushi; Ninomiya, Masakazu; and Maeda, Katuya, 4,538,578, Cl. 123-478.000.
Takei, Toshihiro; Hattori, Yoshiyuki; and Ohnishi, Shunsaku, 4,538,958, Cl. 415-53.00T.
Nishida, Takeshi: *See*—
Sato, Keishi; Nishida, Takeshi; Kamiya, Toji; and Tanaka, Yutaka, 4,539,255, Cl. 428-252.000.
Nishihara, Hisakatsu; and Yoshimitsu, Arata, to Kubota, Ltd. Assembly roll for high temperature service. 4,538,668, Cl. 164-448.000.
Nishihira, Keigo: *See*—
Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; Inoue, Teruhiko; and Oomori, Kiyosi, 4,539,403, Cl. 544-326.000.
Nishikawa, Horotaka, to Toyo Seikan Kaisha Limited. Redrawing-ironing apparatus. 4,538,441, Cl. 72-349.000.
Nishimura, Keizo: *See*—
Hoshino, Takashi; Arai, Takao; and Nishimura, Keizo, 4,539,605, Cl. 360-32.000.
Nishimura, Toshiaki, to Sumitomo Durez Company, Ltd. Refractory material. 4,539,343, Cl. 523-145.000.
Nishimura, Yuji: *See*—
Kawaguchi, Teruhiko; Nishimura, Yuji; and Fujiwara, Akinori, 4,538,774, Cl. 242-107.000.
Nishina, Takashi: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; and Shirakawa, Isao, 4,539,150, Cl. 260-239.30B.
Nishioka, Akira; Kawanabe, Yoshihiro; Takahori, Hiroyuki; and Fujimoto, Hideki, to Pioneer Electronic Corporation. Voltage/current conversion circuit. 4,539,491, Cl. 307-297.000.
Nishisako, Shizutaka: *See*—
Mori, Teijiro; Wada, Yuichi; Nishisako, Shizutaka; Tazawa, Hiroaki; and Masuda, Shigeru, 4,539,451, Cl. 200-147.00R.
Niska, Raimo A.: *See*—
Blomqvist, Seppo I.; Saarela, Markku T.; Huhtala, Martti E.; Niska, Raimo A.; and Vaittinen, Hannu A., 4,538,986, Cl. 432-236.000.
Nissan Motor Co., Ltd.: *See*—
Aono, Shigeo, 4,538,454, Cl. 73-115.000.
Hayashi, Yoshimasa, 4,538,554, Cl. 123-41.210.
Kobayashi, Yasushi; and Umezawa, Hidetsugu, 4,538,649, Cl. 139-435.000.
Muroi, Akira; Sano, Masakatsu; Kamiya, Junichi; Okajima, Masao; and Inoue, Arifumi, 4,538,697, Cl. 180-68.400.
Shinzawa, Motohiro; Arai, Motomi; Roppongi, Shomatsu; Dozono, Kichihiko; and Hasegawa, Yoji, 4,538,413, Cl. 60-303.000.
Sugino, Shigemi; Sasaki, Kenichi; and Iwasa, Yoshio, 4,538,569, Cl. 123-316.000.
Suzuki, Kunihiko, 4,538,700, Cl. 180-248.000.
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,539,643, Cl. 364-431.090.
Yamamoto, Yukio, 4,539,466, Cl. 219-203.000.
Nissan Shatai Company, Limited: *See*—
Kobayashi, Shinma, 4,538,760, Cl. 237-2.00A.
Nisshin Chemical Industry Co., Ltd.: *See*—
Fukumoto, Masafumi, 4,538,678, Cl. 165-162.000.
Nisshin Kogyo Kabushiki Kaisha: *See*—
Nagai, Shigeo, 4,538,712, Cl. 192-18.00R.
Seki, Masayuki, 4,538,708, Cl. 188-73.380.
Nissin Kogyo Kabushiki Kaisha: *See*—
Hachiro, Nobuaki, 4,538,503, Cl. 91-376.00R.
Nixon, Bryan E.; Ward, Donald W.; and Zaucha, Ronald J., to Goodyear Tire & Rubber Company, The. Apparatus and method for forming a co-extrusion from extruded strips. 4,539,169, Cl. 264-171.000.

NL Industries, Inc.: *See—*
Short, Lot W., Jr., 4,538,690, Cl. 175-329.000.
Nobex AB: *See—*
Frieberg, Bengt O., 4,538,313, Cl. 10-86.00B.
Noda, Koshi: *See—*
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,538,329, Cl. 19-244.000.
Noda, Tsutomu: *See—*
Iso, Yoshimi; Inoue, Shigeki; Noda, Tsutomu; and Ohashi, Shinichi, 4,539,665, Cl. 369-44.000.
Noguchi, Hiroshi: *See—*
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Noguchi, Takaharu: *See—*
Arai, Takao; Yamazaki, Shigeru; Kanazawa, Yasunori; and Noguchi, Takaharu, 4,539,615, Cl. 360-121.000.
Nohara, Akira; and Kuzuna, Seiji, to Takeda Chemical Industries, Ltd. 5-Oxo-5H-(1)benzopyrano(2,3-b)pyridine derivatives, their production and use as anti-inflammatory agents. 4,539,326, Cl. 514-285.000.
Nomura, Mitugu: *See—*
Kaneda, Hiroshi; Shibata, Kenji; Nomura, Mitugu; and Sano, Fumihiko, 4,539,088, Cl. 204-182.500.
Kaneda, Hiroshi; Shibata, Kenji; Nomura, Mitugu; and Sano, Fumihiko, 4,539,091, Cl. 204-301.000.
Nomura, Toshio; Taguchi, Eiji; and Aoi, Tomio, to Honda Giken Kogyo Kabushiki Kaisha. Fuel injection apparatus for internal combustion engine. 4,538,577, Cl. 123-452.000.
Nonnecke, Ernst A. Ship hull for single-screw vessel, twin-screw vessel with two aftbodies and catamaran. 4,538,537, Cl. 114-57.000.
Nordson Corporation: *See—*
Kennon, James L.; Sieminski, Richard; Sharpless, John; and Scharf, Donald, 4,538,542, Cl. 118-302.000.
Norris, Elwood G., to American Technology Corporation. Ear radio. 4,539,708, Cl. 455-49.000.
Norse Leasing Corp.: *See—*
Wostal, Terry K., 4,538,791, Cl. 251-339.000.
Norsworthy, Keith H., to Boeing Company, The. FM/CW radar linearization network and method therefor. 4,539,565, Cl. 343-14.000.
Northern Telecom Limited: *See—*
Este, Grantley O.; Suthers, Mark S.; and Streater, Richard W., 4,539,502, Cl. 310-313.00B.
Munter, Ernst A., 4,539,692, Cl. 375-98.000.
Rosenbaum, Stanley D.; and Holy, Zdenek J., 4,539,438, Cl. 179-18.0FA.
Thomas, Terence N.; and Hogeboom, John G., 4,539,531, Cl. 331-11.000.
Norton, Daniel E., to Nike, Inc. Athletic shoe with ridged outsole. 4,538,366, Cl. 36-32.00R.
Nosal, Vsevolod V.; Rybakov, Jury V.; Golovkin, Viktor T.; Novokreschenov, Mikhail M.; Lysikov, Boris V.; and Staneshin, Anatoly V. Method of manufacturing a multicore cable. 4,538,350, Cl. 29-825.000.
Nose, Noriyuki, to Canon Kabushiki Kaisha. Reading apparatus. 4,539,482, Cl. 250-578.000.
Nouvertne , Werner; and Stix, Wolfgang, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions. 4,539,370, Cl. 525-67.000.
Novak, Joseph H.: *See—*
Fleck, David C.; Novak, Joseph H.; and Koerber, Clement J., Sr., 4,539,560, Cl. 340-573.000.
Novis, Joseph R. Electrical bridging connector with post separator housing. 4,538,877, Cl. 339-156.00R.
Novokreschenov, Mikhail M.: *See—*
Nosal, Vsevolod V.; Rybakov, Jury V.; Golovkin, Viktor T.; Novokreschenov, Mikhail M.; Lysikov, Boris V.; and Staneshin, Anatoly V., 4,538,350, Cl. 29-825.000.
Novotny, John C.: *See—*
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Nowacki, Christopher; and Brisson, Alfred G., to Trutek Research Inc. Inhalation valve. 4,538,620, Cl. 128-725.000.
Nowak, James M.: *See—*
Espelage, Paul M.; and Nowak, James M., 4,539,514, Cl. 318-778.000.
Numata, Tatsuo: *See—*
Ishida, Kohji; Numata, Tatsuo; and Sakamoto, Masaharu, 4,539,697, Cl. 381-7.000.
Nunlist, Erwin J., to Kennecott Corporation. Apparatus for applying internal coatings in hot vessels. 4,538,543, Cl. 118-308.000.
Nuovo Pignone S.p.A.: *See—*
Corain, Luciano, 4,538,648, Cl. 139-79.000.
Nusser, Horst D.: *See—*
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Nyegaard & Co. A/S: *See—*
Benneche, Tore; Strande, Per; and Undheim, Kjell, 4,539,324, Cl. 514-274.000.
Nyman, Stephen H. Method for forming glazed tile. 4,538,588, Cl. 125-23.00R.
O. M. Scott & Sons Company, The: *See—*
Lemkin, Jack L., 4,538,762, Cl. 239-232.000.
Oakes, John, to Lever Brothers Company. Bleaching and cleaning composition. 4,539,132, Cl. 252-95.000.
Obata, Makoto: *See—*
Sugio, Takashi; Obata, Makoto; and Ito, Shotaro, 4,538,963, Cl. 416-203.000.
Oberg, Bradley W.: *See—*
Yeager, Raymond W.; and Oberg, Bradley W., 4,538,390, Cl. 52-221.000.
Occidental Chemical Corporation: *See—*
Wagner, George M., 4,539,045, Cl. 106-18.130.
Ochi, Kunihiko: *See—*
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Ochiai, Masahito: *See—*
King, Ming L.; Chiang, Chin-Chih; Ling, Han-Chin; Ochiai, Masahito; Fujita, Eiichi; and McPhail, Andrew T., 4,539,414, Cl. 549-458.000.
O'Connell, Peter; and Gibbs, Michael A., to O'Connell, Peter M. Process for making a structured meat product. 4,539,210, Cl. 426-56.000.
O'Connell, Peter M.: *See—*
O'Connell, Peter; and Gibbs, Michael A., 4,539,210, Cl. 426-56.000.
O'Connor, Terry J.; and Cooper, Ian G., to Bay Mills Limited. Reinforcing composite for roofing membranes and process for making such composites. 4,539,254, Cl. 428-236.000.
Odessky Politekhnichesky Institut: *See—*
Dzjuba, Vladimir F.; Besedin, Vladlen L.; and Birjukov, Boris N., 4,538,474, Cl. 74-63.000.
Odorisio, Paul: *See—*
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Odselius, Leif: *See—*
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Oeda, Yoshitaka: *See—*
Kojima, Kazuo; Yamahira, Hitoshi; and Oeda, Yoshitaka, 4,539,225, Cl. 427-150.000.
O'Flanagan, Michael, to Institute for Industrial Research & Standards. Support assembly for shelving. 4,538,784, Cl. 248-244.000.
Ogawa, Hiroshi; and Yamagami, Tamotsu, to Sony Corporation. Method and apparatus for encoding a binary digital information signal. 4,539,691, Cl. 375-37.000.
Ogishima, Tetsuo, to Honda Giken Kogyo K.K. Headlight device with two lights for motorcycles. 4,539,627, Cl. 362-72.000.
Ogletree, David D.: *See—*
Knepshield, William R.; Ogletree, David D.; and Sander, Nat, 4,538,356, Cl. 33-185.00R.
Ogura Clutch Co. Ltd.: *See—*
Takata, Terasu; and Inoue, Haruo, 4,538,711, Cl. 192-18.00R.
Oh, Chang H., to J & L Importers, Inc. Cookware having integrally formed natural stone bottoms and method of manufacturing the same. 4,538,590, Cl. 126-390.000.
Ohashi, Makoto: *See—*
Donuma, Kenichi; Ohashi, Makoto; and Ozeki, Takeshi, 4,539,476, Cl. 250-227.000.
Ohashi, Shinichi: *See—*
Iso, Yoshimi; Inoue, Shigeki; Noda, Tsutomu; and Ohashi, Shinichi, 4,539,665, Cl. 369-44.000.
Ohchi, Torao; and Yasui, Hideo, to Tokyo Juki Industrial Co., Ltd. Workpiece holding-down device for a sewing machine. 4,538,533, Cl. 112-239.000.
Ohio State Home Services, Inc.: *See—*
DiCello, Robert T., 4,538,386, Cl. 52-169.500.
Ohishi, Kenji; and Hashimoto, Yasuhiko, to Mitsubishi Denki Kabushiki Kaisha. Integral type air conditioning device. 4,538,425, Cl. 62-280.000.
Ohnishi, Shunsaku: *See—*
Takei, Toshihiro; Hattori, Yoshiyuki; and Ohnishi, Shunsaku, 4,538,958, Cl. 415-53.00T.
Ohshima, Mistuyoshi: *See—*
Takamizawa, Minoru; Yamamoto, Akira; Ishihara, Toshinobu; and Ohshima, Mistuyoshi, 4,539,417, Cl. 556-435.000.
Ohshiro, Hideyuki: *See—*
Katsumoto, Naoaki; Ohshiro, Hideyuki; and Sakai, Masanori, 4,538,856, Cl. 297-367.000.
Ohta, Hiroyasu: *See—*
Komeya, Katsutoshi; Tsuge, Akihiko; Inoue, Hiroshi; and Ohta, Hiroyasu, 4,539,298, Cl. 501-89.000.
Ohta, Michio; Kamei, Sakito; and Aoki, Kazumi, to Hitachi Shipbuilding & Engineering Co., Ltd. First-order balancer of internal combustion engine. 4,538,481, Cl. 74-603.000.
Ohtani, Hiroko; and Toyokawa, Kazuharu, to International Business Machines Corporation. Red-emitting superlinear phosphor. 4,539,506, Cl. 313-467.000.
Ohzeki, Osamu; Shimakawa, Katsuhiko; and Mashino, Zenichi, to Nikka Chemical Industry Co., Ltd.; and Chiyoda Chemical Enginrng & Constrct. Co. Ltd. Pitch-containing composition. 4,539,012, Cl. 44-51.000.
Oishi, Kiyohiko; Ishida, Yasuhiko; and Takama, Kenichirou, to Toyota Jidosha Kabushiki Kaisha. Exhaust gas cleaning device for diesel engines. 4,538,412, Cl. 60-288.000.
Ojima, Shin; Kamiuchi, Hideaki; and Mine, Keiji, to Hosiden Electronics Co., Ltd. Automatic bread baking machine. 4,538,509, Cl. 99-348.000.
Oka, Yoshinobu, to Laurel Bank Machine Co., Ltd. Bill discriminating method. 4,539,702, Cl. 382-7.000.
Okabayashi, Norio, to Daicel Chemical Industries, Ltd. Method and apparatus for electroforming a stamper for producing a high-density information recording carrier. 4,539,079, Cl. 204-5.000.
Okabe, Yoshio, to Aisin Seiki Kabushiki Kaisha. Tensioning device for belt or the like. 4,539,001, Cl. 474-138.000.
Okada, Satoshi: *See—*
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,539,155, Cl. 260-112.50R.

Okada, Yoshio: *See—*
Hara, Senri; Tomono, Hiroshi; Kimura, Tomohiko; Inoue, Kunio; Sato, Takayuki; and Okada, Yoshio, 4,538,667, Cl. 164-418.000.

Okajima, Masao: *See—*
Muroi, Akira; Sano, Masakatsu; Kamiya, Junichi; Okajima, Masao; and Inoue, Arifumi, 4,538,697, Cl. 180-68.400.

Okamoto, Jiro: *See—*
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Okamoto, Tetsuo: *See—*
Sasaki, Yoshiyuki; Kobayashi, Shigenobu; Okamoto, Tetsuo; and Minemura, Norihiro, 4,539,242, Cl. 428-92.000.

Okano, Takashi, to Pioneer Video Corporation. Time axis correction device for multiplex information-carrying signal obtained from recording medium. 4,539,602, Cl. 358-337.000.

Okey, David W.: *See—*
Lee, Raymond; Okey, David W.; and Ferro, Gregory A., 4,539,342, Cl. 521-189.000.

Okino, Susumu: *See—*
Shinoda, Naoharu; Tatani, Atsushi; Inoue, Kenji; and Okino, Susumu, 4,539,190, Cl. 423-240.000.

Okumura, Katsuya; and Ueda, Masaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of forming electrode/wiring layer. 4,538,344, Cl. 29-589.000.

Okuyama, Yoshikazu: *See—*
Takeuchi, Hajime; and Okuyama, Yoshikazu, 4,539,603, Cl. 360-10.100.

Oleck, Stephen M.; Le, Quang N.; and Neuman, Daniel J., to Mobil Oil Corporation. Method and catalyst for removing contaminants from hydrocarbonaceous fluids using a copper-Group VIA metal-alumina catalyst. 4,539,101, Cl. 208-251.00H.

Oliver, Michael. Method of providing infinitely adjustable eccentric motion from a rotary motion. 4,538,336, Cl. 29-426.600.

Olympus Optical Co. Ltd.: *See—*
Ishii, Fumiaki, 4,538,593, Cl. 128-4.000.
Kato, Toshikazu; and Osanai, Akira, 4,539,609, Cl. 360-93.000.
Kubota, Tetsumaru, 4,538,610, Cl. 128-303.150.
Manabe, Sugio, 4,539,296, Cl. 436-47.000.
Sato, Masanobu, 4,539,700, Cl. 381-90.000.

O'Malley, William J.; and Vaughn, Howard A., Jr., to General Electric Company. Silicone resin coating composition with improved shelf life. 4,539,351, Cl. 524-43.000.

Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, to Kuraray Co., Ltd. Adhesive composition. 4,539,382, Cl. 526-276.000.

Ong, DeWitt G.: *See—*
Davis, Paul C.; Jackson, Raymond G.; Nahas, Joseph J.; Nelson, Dale H.; Ong, DeWitt G.; and Wittman, Brian A., 4,539,552, Cl. 340-347.0DA.

Ontario Research Foundation: *See—*
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Oomori, Kiyosi: *See—*
Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; Inoue, Teruhiko; and Oomori, Kiyosi, 4,539,403, Cl. 544-326.000.

Opitz, Wolfgang; Jacobi, Haireddin; and Pelster, Bernhard, to Troponwerke GmbH & Co. Quinazolinone derivatives. 4,539,402, Cl. 544-247.000.

Optical Coating Laboratory, Inc.: *See—*
Anthon, Erik W., 4,538,913, Cl. 356-371.000.

Optical Disc Corporation: *See—*
Winslow, John S., 4,539,673, Cl. 369-284.000.

Orban, Erno ; Borvendeg, Janos; Nagy, Laszlo ; Sotinee Tolvay, Marta; and Bander, Erzsebet, to Egyt Gyogyszervegyeszeti Gyar. Sustained release pharmaceutical compositions. 4,539,199, Cl. 424-22.000.

Orcutt, Donald R., to Babcock & Wilcox Company, The. Fiber pipe protection for water cooled pipes in reheat furnaces. 4,539,055, Cl. 156-92.000.

Oritani, Atushi, to Fujitsu Limited. Static-type semiconductor memory device. 4,539,661, Cl. 365-230.000.

Orlowski, Gerald J., to Fun-Tech Products Company. Spinning toy. 4,538,999, Cl. 446-259.000.

Osaka, Haruya; Maekawa, Takashi; and Nakajima, Yoshihiro, to Mita Industrial Co., Ltd. Latent electrostatic image developing apparatus. 4,538,897, Cl. 355-3.0DD.

Osaka Sanso Kogyo Ltd.: *See—*
Sakuraya, Toshikazu; Fujii, Tetsuya; Matsui, Shigeo; and Hayashi, Shigeki, 4,539,020, Cl. 55-26.000.

Osanai, Akira: *See—*
Kato, Toshikazu; and Osanai, Akira, 4,539,609, Cl. 360-93.000.

Oshida, Masahiro: *See—*
Kiriyama, Tsutomu; Horie, Shigeru; Ichihashi, Tetsuo; and Oshida, Masahiro, 4,539,389, Cl. 528-272.000.

Ostrobrod, Meyer: *See—*
Ellis, J. Nigel; and Ostrobrod, Meyer, 4,538,703, Cl. 182-5.000.

Otake, Yoshichi, to Victor Company of Japan, Ltd. Television camera having an optical filter. 4,539,584, Cl. 358-44.000.

Otaki, Sakashi: *See—*
Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, 4,539,662, Cl. 369-13.000.

Otis Elevator Company: *See—*
Koppensteiner, Werner, 4,538,706, Cl. 187-90.000.

Otsuki, Haruki: *See—*
Igarashi, Takashi; Mukai, Nakashiro; and Otsuki, Haruki, 4,538,475, Cl. 74-368.000.

Ott, Gunther: *See—*
Geist, Michael; and Ott, Gunther, 4,539,385, Cl. 528-100.000.

Otten, Hans-Gunter: *See—*
Nickel, Horst; and Otten, Hans-Gunter, 4,539,009, Cl. 8-641.000.

Otter Controls Limited: *See—*
Phillips, Richard A.; Fletcher, Keith; and Naylor, Peter W., 4,539,468, Cl. 219-330.000.

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Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,539,404, Cl. 544-335.000.

Oulie, Michel B.: *See—*
Muller, Guy L.; Fraioli, Daniel F.; and Oulie, Michel B., 4,539,185, Cl. 422-233.000.

Outboard Marine Corporation: *See—*
Kenik, Frank W., 4,538,445, Cl. 73-3.000.

Outlaw, Benjamin T.: *See—*
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,539,404, Cl. 544-335.000.

Outokumpu Oy: *See—*
Blomqvist, Seppo I.; Saarela, Markku T.; Huhtala, Martti E.; Niska, Raimo A.; and Vaittinen, Hannu A., 4,538,986, Cl. 432-236.000.

Overbeek, Wilhelmus R. M.: *See—*
Vandewalle, Maurits; Vanmaele, Luc J.; De Clercq, Pierre J.; Halkes, Sebastianus J.; and Overbeek, Wilhelmus R. M., 4,539,153, Cl. 260-397.200.

Overton, Raymond C.; and Cole, Charles F., to Conoco Inc. Tracking temperature controller apparatus. 4,538,672, Cl. 165-27.000.

Ovren, Christer: *See—*
Brogardh, Torgny; and Ovren, Christer, 4,539,473, Cl. 250-211.00R.

Owens-Corning Fiberglas Corporation: *See—*
Hager, Thomas P.; and Ferguson, Larry W., 4,539,021, Cl. 55-97.000.
Pollet, Jean-Claude; Flautt, Martin C.; and Armstrong, Gordon P., 4,539,364, Cl. 524-488.000.
Yeager, Raymond W.; and Oberg, Bradley W., 4,538,390, Cl. 52-221.000.

Owens-Illinois, Inc.: *See—*
Burzynski, Alfred J.; and Stengle, Edward J., 4,539,232, Cl. 427-387.000.

Oy Partek AB: *See—*
Paakkinen, Ilmari, 4,539,165, Cl. 264-23.000.

Oy Tampella AB Lapintie: *See—*
Majaniemi, Pekka, 4,539,075, Cl. 162-343.000.

Oyekan, Soni O., to Engelhard Corporation. Activation of platinum containing reforming catalysts. 4,539,307, Cl. 502-223.000.

Ozari, Yehuda: *See—*
Gajria, Chandrasen; and Ozari, Yehuda, 4,539,348, Cl. 523-409.000.

Ozawa, Masakazu: *See—*
Watanabe, Takashi; Ozawa, Masakazu; Koizumi, Yutaka; and Matsumoto, Haruyuki, 4,539,569, Cl. 346-140.00R.

Ozeki, Takeshi: *See—*
Donuma, Kenichi; Ohashi, Makoto; and Ozeki, Takeshi, 4,539,476, Cl. 250-227.000.

P I E International Inc.: *See—*
Trikilis, Theodore N., 4,538,833, Cl. 281-2.000.

P.V. Tool, Inc: *See—*
Vindez, Pierre G., 4,538,942, Cl. 408-14.000.

Paakkinen, Ilmari, to Oy Partek AB. Method for the casting of large-size objects out of a high-viscosity concrete mix. 4,539,165, Cl. 264-23.000.

Paar, Willibald, to Vianova Kunstharz, A.G. Cationic paint binders and process for producing same. 4,539,372, Cl. 525-128.000.

Pacific Scientific Company: *See—*
Webster, Donald R., 4,538,908, Cl. 356-36.000.

Pack, Un C.; and Schroeder, Charles M., Jr., to AT&T Technologies, Inc. High speed lightguide coating apparatus. 4,539,226, Cl. 427-163.000.

Page, Aime R. Gravity feed dog feeder. 4,538,548, Cl. 119-52.00R.

Palfalvi, Gyorgy: *See—*
Bodas, Janos; Bakay, Arpad; Papp, Istvan; Palfalvi, Gyorgy; and Kovacs, Gyula, 4,538,677, Cl. 165-146.000.

Palilla, Frank C.; MacAllister, Burton W., Jr.; and Salemi, Caster, to GTE Laboratories Incorporated. Method for making a varistor package. 4,538,347, Cl. 29-619.000.

Palmer, David N.; and Ferrell, Gary W., to Combustion Engineering, Inc. Method for making a composite cathode active material/current collector product. 4,539,052, Cl. 148-6.240.

Panametrics, Inc.: *See—*
Lynnworth, Lawrence C.; and Matson, James E., 4,538,469, Cl. 73-861.270.

Pantone, Richard S.: *See—*
Dewhurst, John E.; Dormish, Jeffrey F.; and Pantone, Richard S., 4,539,156, Cl. 260-453.0SP.
Dewhurst, John E.; Dormish, Jeffrey F.; and Pantone, Richard S., 4,539,157, Cl. 260-453.0SP.
Dewhurst, John E.; Dormish, Jeffrey F.; and Pantone, Richard S., 4,539,158, Cl. 260-453.0SP.

Panush, Sol, to Inmont Corporation. Substrate coated with opalescent coating and method of coating. 4,539,258, Cl. 428-324.000.

Papp, Istvan: *See—*
Bodas, Janos; Bakay, Arpad; Papp, Istvan; Palfalvi, Gyorgy; and Kovacs, Gyula, 4,538,677, Cl. 165-146.000.

Paradowski, Henri; and Leroux, Didier, to Compagnie Francaise d'Etudes et de Construction "Technip" . Method and apparatus for

cooling and liquefying at least one gas with a low boiling point, such as for example natural gas. 4,539,028, Cl. 62-9.000.
Paraid Limited: *See*—
Lemarie, Romeo, 4,538,826, Cl. 280-242.0WC.
Pariani, Emilio, to Costruzioni Aeronautiche Giovanni Agusta S.p.A. Device for controlling cyclic and collective pitch of a helicopter rotor. 4,538,961, Cl. 416-114.000.
Park, Richard M.: *See*—
Tymkewicz, John; Phillips, Robert L.; and Park, Richard M., 4,538,515, Cl. 101-216.000.
Parker Chemical Company: *See*—
Hacias, Kenneth J., 4,539,051, Cl. 148-6.15Z.
Parker-Hannifin Corporation: *See*—
Stevens, Curtis E., 4,538,633, Cl. 137-85.000.
Parks, Armond O. Ring sizing insert. 4,538,430, Cl. 63-15.600.
Parrish, Henry H.: *See*—
Chiu, Ran F.; Kromer, Philip F., III; Kao, Ming L.; and Parrish, Henry H., 4,539,689, Cl. 375-13.000.
Partin, James R.; and Rawlings, John P., to Geo-Systems, Inc. Drilled well series and paralleled heat exchange systems. 4,538,673, Cl. 165-45.000.
Partington, Sally: *See*—
Beales, Keith J.; Carter, Steve F.; Partington, Sally; and France, Paul W., 4,539,033, Cl. 65-134.000.
Parviainen, Arno. Counter-action device for exercise device. 4,538,805, Cl. 272-118.000.
Pashley, David H., to Medical College of Ga. Research Institute, Inc. Method of decreasing the permeability of a dental cavity. 4,538,990, Cl. 433-217.000.
Paskowski, Frank J., Jr.; and Stanwicks, Peter L., to Combustion Engineering, Inc. Pulverizer journal bearing system. 4,538,768, Cl. 241-101.200.
Pasquier, Armand, to Etudes Techniques et Realisations (CdF Ingenierie) S.A. Snow transfer installation. 4,538,369, Cl. 37-219.000.
Pastor, Jose, to Pitney Bowes Inc. Image thinning process. 4,539,704, Cl. 382-55.000.
Pastor, Stephen D.: *See*—
Spivack, John D.; Pastor, Stephen D.; and Odorisio, Paul, 4,539,421, Cl. 560-105.000.
Pastva, Charles S. Disposable mixing palette and container. 4,538,726, Cl. 206-44.120.
Patel, Vithal K.: *See*—
Powell, David R.; and Patel, Vithal K., 4,539,198, Cl. 424-19.000.
Patenaude, Richard S., to Maine Yankee Atomic Power Company. Fuel pin transfer tool. 4,539,174, Cl. 376-261.000.
Patil, Kashinath Z.: *See*—
Leftin, Harry P.; and Patil, Kashinath Z., 4,539,310, Cl. 502-303.000.
Patrick, Charles T., Jr., to NDM Corporation. Skin preparation method and product. 4,538,612, Cl. 128-333.000.
Patterson, Hubert A.: *See*—
Mears, David F.; and Patterson, Hubert A., 4,539,706, Cl. 455-11.000.
Patzig, Dieter, to Taprogge Gesellschaft GmbH. Device for removing cleaning balls from a cooling water stream. 4,539,115, Cl. 210-409.000.
Pawelchak, John M.; and Freeman, Frank M., to E. R. Squibb & Sons, Inc. Dressings, granules, and their use in treating wounds. 4,538,603, Cl. 128-156.000.
Pearce, David: *See*—
Allen, John; and Pearce, David, 4,538,863, Cl. 339-12.00R.
Pease, Nicolas C., to International Standard Electric Corporation. Flaw detection in wire drawing. 4,538,463, Cl. 73-587.000.
Pechacek, Raymond E., to Hahn & Clay. Frame for constructing a hemispherical multi-layered shell. 4,538,798, Cl. 269-289.00R.
Peery, John R.: *See*—
Eckenhoff, James B.; Place, Virgil A.; and Peery, John R., 4,539,004, Cl. 604-131.000.
Peetz, Walter; Wilking, Hans; and Kafitz, Egon, to Keiper Recaro GmbH & Co. Adjusting arrangement for seat, particularly power vehicle seat. 4,538,855, Cl. 297-362.000.
Pelster, Bernhard: *See*—
Opitz, Wolfgang; Jacobi, Haireddin; and Pelster, Bernhard, 4,539,402, Cl. 544-247.000.
Pennwalt Corporation: *See*—
Cascone, Paul J., 4,539,176, Cl. 420-463.000.
Perach, Asi, to Ambac Industries, Inc. Control valve assembly. 4,538,645, Cl. 137-625.650.
Perazzolo, Eugenio; and Tomasi, Mauro, to Rainer S.r.l. Machine tool for working sheet metal. 4,538,493, Cl. 83-530.000.
Pergeau, Raymond J. Card holder. 4,538,813, Cl. 273-150.000.
Perkin-Elmer Corporation, The: *See*—
La Fiandra, Carlo, 4,539,695, Cl. 378-34.000.
Permobil AB: *See*—
Engman, Bo H. S., 4,538,857, Cl. 297-437.000.
Perry, Dennis A.; and Wilmot, David H., to Hayden Nilos Conflow Limited. Nozzle conveniently assembled and disassembled. 4,538,763, Cl. 239-600.000.
Perry, T. Cooper, to West Point Foundry & Machine Co. Creel apparatus. 4,538,776, Cl. 242-131.000.
Pertl, Peter. Machine for surfacing floors. 4,538,544, Cl. 118-665.000.
Pet, Incorporated: *See*—
Limousin, Jean-Louis, 4,538,720, Cl. 198-416.000.
Peterkin, Stuart M.: *See*—
Simpson, Anthony; Peterkin, Stuart M.; Brooksby, Brian T.; and Murray, Harold J., 4,538,991, Cl. 434-12.000.
Petersen, Benjamin R., Jr., to Fantasy Flavors, Inc. Tamper resistant closure. 4,538,740, Cl. 215-246.000.
Peterson American Corporation: *See*—
Mayers, Walter T., 4,538,563, Cl. 123-90.670.
Peterson, Bruce W.: *See*—
Cuscurida, Michael; Yeakey, Ernest L.; and Peterson, Bruce W., 4,539,339, Cl. 521-137.000.
Peterson, Robert A. Cigarette case. 4,538,751, Cl. 224-252.000.
Petigoretz, Walter. Releasable downrigger clip. 4,538,372, Cl. 43-27.400.
Petrolite Corporation: *See*—
Quinlan, Patrick M., 4,539,140, Cl. 252-391.000.
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,539,404, Cl. 544-335.000.
Peyronnenc, Michel H. P.: *See*—
Ambroise, Modeste; Demange, Michel; Lebizay, Gerald; Munier, Jean-Marie; and Peyronnenc, Michel H. P., 4,539,678, Cl. 370-86.000.
Pfeiffer, Arnold: *See*—
Gruner, Hans; Pfeiffer, Arnold; Rommerswinkel, Heinrich-Wilhelm; and Vest, Rolf, 4,539,042, Cl. 75-43.000.
Pfizer Inc.: *See*—
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,539,322, Cl. 514-253.000.
Pfleiderer, Hans-Joerg; and Knauer, Karl, to Siemens Aktiengesellschaft. Transversal filter having parallel inputs. 4,539,537, Cl. 333-165.000.
Philip Morris Incorporated: *See*—
Chan, W. Geoffrey; and Houminer, Yoram, 4,538,627, Cl. 131-276.000.
Podraza, Kenneth F., 4,538,628, Cl. 131-277.000.
Philipson, Joseph: *See*—
Hall, Charles P.; Philipson, Joseph; and Johenning, John B., 4,538,311, Cl. 5-451.000.
Phillips Petroleum Company: *See*—
Kukes, Simon G.; and Banks, Robert L., 4,539,308, Cl. 502-243.000.
Yudovich, Amos, 4,539,098, Cl. 208-11.0LE.
Phillips, Richard A.; Fletcher, Keith; and Naylor, Peter W., to Otter Controls Limited. Water boiling vessel immersion heater with primary and secondary thermal cut-out protection. 4,539,468, Cl. 219-330.000.
Phillips, Robert L.: *See*—
Tymkewicz, John; Phillips, Robert L.; and Park, Richard M., 4,538,515, Cl. 101-216.000.
Phoenix Digital Corporation: *See*—
Trussell, Gerald C.; Felix, Andre B.; Hembree, Thomas D.; and Rollins, Paul F., 4,539,655, Cl. 364-900.000.
Piccioli, David P.; Harry, Ieuan L.; and Clark, Richard E., to Continental Packaging Company, Inc. Trimming of polyester containers using a laser. 4,539,463, Cl. 219-121.0LG.
Pierpaoli, Piero: *See*—
Bianchi, Gianfranco; Pierpaoli, Piero; Borelli, Riccardo; and Rainoldi, Luciano, 4,538,465, Cl. 73-722.000.
Pierre Fabre S.A.: *See*—
Mouzin, Gilbert; Cousse, Henri; and Vilain, Pol, 4,539,413, Cl. 549-366.000.
Piezoelectric Technology Investors, Inc.: *See*—
Juptner, William F.; Macy, David F.; and Staudte, Juergen H., 4,538,461, Cl. 73-505.000.
Pigeroulet, Jean: *See*—
Straubel, Max; Eisele, Hermann; Leblanc, Jean; and Pigeroulet, Jean, 4,538,580, Cl. 123-494.000.
Pilkington P.E. Limited: *See*—
Kitchen, Cedric A., 4,538,527, Cl. 109-21.000.
Pimley, John J., to Black Clawson Company, The. Apparatus for recovering paper-making fiber from contaminated waste paper products. 4,538,767, Cl. 241-79.300.
Pinassi, David J.: *See*—
Glover, Loren J.; Flower, Milton O.; and Pinassi, David J., 4,538,725, Cl. 206-37.000.
Pinger, Egon; and Stapelmann, Jan W., to Staco Stapelmann GmbH. Method of manufacturing gratings and apparatus for carrying out the method. 4,539,457, Cl. 219-58.000.
Pioneer Electric Corporation: *See*—
Miyakawa, Tsutomu; Yamane, Junji; Takagi, Masahiro; Arai, Tomoyoshi; Tanaka, Haruhiko; Morita, Yuji; and Sakurai, Satoshi, 4,539,669, Cl. 369-75.200.
Pioneer Electronic Corporation: *See*—
Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, 4,539,662, Cl. 369-13.000.
Ishibashi, Masaya; Tada, Atuki; and Kanda, Jun, 4,539,663, Cl. 369-34.000.
Ishida, Kohji; Numata, Tatsuo; and Sakamoto, Masaharu, 4,539,697, Cl. 381-7.000.
Nishioka, Akira; Kawanabe, Yoshihiro; Takahori, Hiroyuki; and Fujimoto, Hideki, 4,539,491, Cl. 307-297.000.
Shizuo, Inaba; Sato, Kiyoshi; Takahashi, Yoshio; and Takahashi, Hideyuki, 4,539,670, Cl. 369-77.100.
Pioneer Video Corporation: *See*—
Okano, Takashi, 4,539,602, Cl. 358-337.000.
Piper, May P.: *See*—
Piper, Melvin E.; and Piper, May P., 4,538,743, Cl. 220-375.000.
Piper, Melvin E.; and Piper, May P. Safety cover for auxiliary brake operating casing. 4,538,743, Cl. 220-375.000.

Pipper, Gunter; Theysohn, Rainer; and Zahradnik, Franz, to BASF Aktiengesellschaft. Continuous hydrolytic preparation of polylactams. 4,539,391, Cl. 528-323.000.
Pitney Bowes Inc.: *See*—
Bosse, Thomas W., 4,539,475, Cl. 250-231.00P.
Pastor, Jose, 4,539,704, Cl. 382-55.000.
Pittway Corporation: *See*—
Dederich, Stanley S.; Schoenfelder, George A.; and Koster, William M., 4,539,556, Cl. 340-515.000.
PKA Pyrolyse Kraftanlagen GmbH: *See*—
Faehnle, Erich, 4,538,528, Cl. 110-229.000.
Place, Virgil A.: *See*—
Eckenhoff, James B.; Place, Virgil A.; and Peery, John R., 4,539,004, Cl. 604-131.000.
Plankenhorn, Daniel J., to Westinghouse Electric Corp. Robotic laser beam delivery apparatus. 4,539,462, Cl. 219-121.0LV.
Planning Research Corporation: *See*—
Welsh, James W., 4,538,675, Cl. 165-80.00C.
Plasse, Paul A., to Polaroid Corporation. Laminar batteries and methods of making the same. 4,539,275, Cl. 429-152.000.
Plastics, Inc.: *See*—
Colato, Albert E.; and Pomroy, James F., 4,539,455, Cl. 219-10.55E.
Plessey Incorporated: *See*—
Ledgerwood, Harry J., 4,538,839, Cl. 285-236.000.
Plifka, John W. Ball hitch trailer lock. 4,538,827, Cl. 280-507.000.
Podraza, Kenneth F., to Philip Morris, Incorporated. Smoking compositions containing a dioxane diester flavorant-release additive. 4,538,628, Cl. 131-277.000.
Poetker, John J.; and Poetker, Peter, to Horizon Technology, Inc. Data processing card system and method of forming same. 4,539,472, Cl. 235-488.000.
Poetker, Peter: *See*—
Poetker, John J.; and Poetker, Peter, 4,539,472, Cl. 235-488.000.
Pointud, Bernard: *See*—
Gagne, Pierre; Girardeau, Yvette; and Pointud, Bernard, 4,539,366, Cl. 524-507.000.
Poirier, Ronald G. Golf stance guage. 4,538,815, Cl. 273-187.00R.
Pojbics, Jeno ; and Magyar, Ferenc, to Latszereszeti Eszkozok Gyara. Method for electrolytic removal of galvanic nickel, chromium or gold layers from the surface of a copper or copper alloy base and apparatus for carrying out the method. 4,539,087, Cl. 204-146.000.
Polaroid Corporation: *See*—
Plasse, Paul A., 4,539,275, Cl. 429-152.000.
Taylor, Lloyd D., 4,539,383, Cl. 526-304.000.
Pollack, Gordon P.; Teng, Clarence; and Hunter, William R., to Texas Instruments Incorporated. Channel stop isolation technology utilizing two-step etching and selective oxidation with sidewall masking. 4,538,343, Cl. 29-576.00W.
Pollet, Jean-Claude; Flautt, Martin C.; and Armstrong, Gordon P., to Owens-Corning Fiberglas Corporation. Hot melt sizes. 4,539,364, Cl. 524-488.000.
Pomroy, James F.: *See*—
Colato, Albert E.; and Pomroy, James F., 4,539,455, Cl. 219-10.55E.
Ponticello, Gerald S.: *See*—
Baldwin, John J.; and Ponticello, Gerald S., 4,539,317, Cl. 514-222.000.
Baldwin, John J.; and Ponticello, Gerald S., 4,539,318, Cl. 514-222.000.
Poppenheimer, Charles B., to GTY Industries. Spa light. 4,539,629, Cl. 362-267.000.
Portable Technology, Inc.: *See*—
Gunter, Rebecca C., 4,538,309, Cl. 5-99.00B.
Post Machinery Company, Inc.: *See*—
Zak, Chet, 4,539,002, Cl. 493-23.000.
Potard, Claude; and Dusserre, Pierre, to Commissariat a l'Energie Atomique. Process for preparing plates of a metallic or semimetallic material from a liquid mass. 4,539,173, Cl. 264-570.000.
Powell, David R.; and Patel, Vithal K., to Rowell Laboratories, Inc. Solid pharmaceutical formulations for slow, zero order release via controlled surface erosion: expanded range. 4,539,198, Cl. 424-19.000.
Power Technology Partners, Ltd.: *See*—
Freeny, Charles C., Jr., 4,539,483, Cl. 290-1.00R.
PPG Industries, Inc.: *See*—
DeLue, Norman R., 4,539,080, Cl. 204-74.000.
Demarest, Henry M., Jr.; and Matesa, Joseph M., 4,539,030, Cl. 65-27.000.
Fecik, Michael T.; Bennett, Terry A.; and Ewing, John J., 4,539,031, Cl. 65-29.000.
Hanneken, Henry P., 4,539,034, Cl. 65-134.000.
McEathron, Eugene D., 4,538,773, Cl. 242-18.00G.
Shaw, Hugh E., Jr., 4,538,912, Cl. 356-366.000.
Prasad, Arun, to Jeneric Industries, Inc. Dental alloys for porcelain-fused-to-metal restorations. 4,539,177, Cl. 420-463.000.
Pravda, Milton F. Method and apparatus useful for rapidly determining the molecular weight of a flowing gaseous material. 4,538,447, Cl. 73-23.000.
Praxmarer, Alfred: *See*—
Flamm, Peter M.; Mlynek, Daniel; Schmidtpott, Friedrich; and Praxmarer, Alfred, 4,539,583, Cl. 358-27.000.
Premel, Ulrich; and Becker, Jorgen, to L & C. Steinmuller GmbH. Gas liquid parallel flow direct current heat exchanger. 4,538,676, Cl. 165-145.000.
Prescher, Gunter: *See*—
Arntz, Dietrich; Prescher, Gunter; Burkhardt, Werner; Heilos, Johannes; and Manner, Reinhard, 4,539,409, Cl. 546-286.000.
Preston, Dennis W. Totally adjustable campfire cooking grill. 4,538,589, Cl. 126-30.000.
Pridy, Whestine B. Water conserving elongate tubular metal member straightening apparatus. 4,538,438, Cl. 72-39.000.
Primtec: *See*—
Sorensen, Jens O., 4,539,171, Cl. 264-328.800.
Prince, Mary F. Oral hygiene instrument. 4,538,631, Cl. 132-84.00R.
Pring, Edward J.: *See*—
Bartlett, Geoffrey M.; Hofmeister, James P.; and Pring, Edward J., 4,539,653, Cl. 364-900.000.
Pringle, Ronald E.; and Black, Paul W., to Camco, Incorporated. Locking annulus safety valve. 4,538,685, Cl. 166-321.000.
Pringle, Ronald E., to Camco, Incorporated. Method and apparatus of sealing threaded sections of a well tool. 4,538,838, Cl. 285-91.000.
Procter & Gamble Company, The: *See*—
Hunter, John E., 4,539,212, Cl. 426-325.000.
Thompson, James E.; and Broaddus, Charles D., 4,539,130, Cl. 252-94.000.
Tse, Hing C., 4,539,216, Cl. 426-597.000.
Proctor, Keith J.; and Doring, John D., to Medtronic, Inc. Thread electrode assembly. 4,538,623, Cl. 128-784.000.
Prodel, Ulrich H. Plastic bottle case and bottle packaging with such case. 4,538,742, Cl. 220-21.000.
Profile Extrusions Company: *See*—
Colliander, Alan C., 4,538,380, Cl. 49-475.000.
Propper Manufacturing Co., Inc.: *See*—
Heine, Helmut A.; Rosenbusch, Helmut W.; and Schmidt, Otto H., 4,538,889, Cl. 351-205.000.
Prosenbauer, Otto, to Inject Star Poekelmaschinen GmbH. Apparatus for separating meat from bones. 4,538,324, Cl. 17-1.00G.
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Tsukagoshi, Yasuhiro, 4,538,975, Cl. 418-55.000.
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Knepshield, William R.; Ogletree, David D.; and Sander, Nat, 4,538,356, Cl. 33-185.00R.
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Sato, Keishi; Nishida, Takeshi; Kamiya, Toji; and Tanaka, Yutaka, to Kanebo Ltd. Moisture-permeable waterproof fabric. 4,539,255, Cl. 428-252.000.
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Sato, Mikio, to Idemitsu Kosan Company. Water-based metal-working fluid. 4,539,125, Cl. 252-32.70E.
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Sauer, Gerhard: *See*—
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Sauer, Harald: *See*—
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Saurenman, Phillip E.; and Casler, William A. Interlocked metal seam structure with in-plane stabilization. 4,538,647, Cl. 138-166.000.
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Schanz, Klaus; Schwind, Albert; Grund, Hartmut; and Klehr, Peter, to Giulini Chemie GmbH. Basic magnesium aluminum hydroxycarbonate. 4,539,195, Cl. 423-419.00P.
Scharf, Donald: *See*—
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Schatzki, Thomas F., to United States of America, Agriculture. Detection of agricultural contraband in baggage. 4,539,648, Cl. 364-555.000.
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Schedel, Wolfgang E. Method of molding an elongate foamed resin article from expandable thermoplastic resin beads. 4,539,167, Cl. 264-51.000.
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Schemel, Roberto; Rodriguez, Domingo; and Salazar, Ramon, to Intevep, S.A. Method for leaching and recovering vanadium from vanadium bearing by-product materials. 4,539,186, Cl. 423-62.000.
Scherff, Helmut, to Mannesmann AG. Sampling molten metal. 4,538,794, Cl. 266-79.000.
Schettler, Paul D., Jr., to Columbia Gas System Service Corporation. Method for determining permeability. 4,538,460, Cl. 73-432.00R.
Schick, Jean-Francois, to Goro S.A. Apparatus for fixing belt-fasteners or the like. 4,538,755, Cl. 227-152.000.
Schieber, Franz, to C. Conradty Nurnberg GmbH & Co KG. Method of providing a shaped carbon article. 4,539,229, Cl. 427-215.000.
Schier, Karl; and Wolters, Gerd-Michael, to MTU- Motoren- und Turbinen-Union Friedrichshafen GmbH. Diesel internal combustion engine. 4,538,584, Cl. 123-559.000.
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Schneider, Michael J., to Allied Corporation. Diesel fuel injector with double dump configuration. 4,538,576, Cl. 123-446.000.
Schnitzler, Willibald, to Romer GmbH. Protective helmet. 4,538,303, Cl. 2-424.000.
Schoch, Robert, to Weinmann GmbH & Co. KG. Two wheel rim brake with rotatable actuating element. 4,538,707, Cl. 188-24.220.
Schoenfelder, George A.: *See*—
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Schott, Helmut: *See*—
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Schreiber, William L.: *See*—
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Schroll, Craig R.: *See*—
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Schromm, Kurt: *See*—
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Schulz, Winfried, to Siemens Aktiengesellschaft. Disconnect switch for metal-clad, pressurized-gas insulated, high-voltage switchgear installation. 4,539,448, Cl. 200-144.0AP.
Schutten, Herman P.; Hoppie, Lyle O.; Turner, David; and Chute, Richard, to Eaton Corporation. Fast acting valve. 4,538,642, Cl. 137-625.280.
Schwartz, Arthur G., to Cates, Charles E. System and apparatus for water conditioning. 4,539,106, Cl. 210-88.000.
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Schwartz, Samuel, to University of Minnesota, Regents of the. Apparatus for quantitatively determining the level of hemoglobin in a biological sample. 4,539,180, Cl. 422-58.000.
Schwarz, Albert J.: *See*—
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Schwarze, Rigobert. Pipe bending machine with bending mandrel. 4,538,436, Cl. 72-8.000.
Schweid, Jeffrey M.; Cohee, Arthur H.; and Dec, Anthony F., to General Foods Corporation. Emulsification system for creamy food products. 4,539,215, Cl. 426-589.000.
Schweiger, Josef; and Hering, Bernhard, to Siemens Aktiengesellschaft. Electromagnetic relay and method for adjusting the armature thereof. 4,539,539, Cl. 335-78.000.
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Sciarra, Michael. In-canal hearing aid. 4,539,440, Cl. 179-107.00E.
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Scott, Norma J. Apparatus for comforting an infant. 4,538,310, Cl. 5-437.000.
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Seaborne, Thomas L. Vacuum pulsator valves. 4,538,634, Cl. 137-103.000.
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Sederquist, Richard A., to United Technologies Corporation. Process for generating steam in a fuel cell powerplant. 4,539,267, Cl. 429-17.000.
Sedgewick, Richard D. Apparatus for winding wire coils on a toothed stack. 4,538,770, Cl. 242-1.10R.
Sedlak, Vaclav; and Jiruse, Jaroslav, to ZVS Adamovske strojirny, koncernovy podnik. Mechanism for the automatic control of printing pressures on printing machines. 4,538,513, Cl. 101-76.000.
Seeley, Frederic F., to F. F. Seeley Nominees Pty. Ltd. Table frame assembly. 4,538,526, Cl. 108-127.000.
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Selenia - Industrie Elettroniche Associate - S.p.A.: *See*—
Rocchi, Luigi, 4,538,907, Cl. 356-1.000.
Senoh, Yasutaka, to New Ohto Co., Ltd. Simplified electric switch construction. 4,539,444, Cl. 200-5.00R.
Sera Solar Corporation: *See*—
Moddel, Garret R.; and Gibbons, James F., 4,539,431, Cl. 136-258.000.
Sethi, Dalbir S.; Meadow, Morton; and Scarito nee Bagnall, Elizabeth A., to FMC Corporation. Process for hydrogenating an alkylated anthraquinone. 4,539,196, Cl. 423-588.000.
SFE Technologies, Inc.: *See*—
Street, William D., 4,538,346, Cl. 29-602.00R.
Shapiro, Theodore. Leg wrap. 4,538,602, Cl. 128-132.000.

Sharpe, Claude A.; and Ho, Cecil C., to Texas Instruments Incorporated. Automatic interference canceling apparatus. 4,539,566, Cl. 343-389.000.

Sharpless, John: *See*—
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Shaw, Hugh E., Jr., to PPG Industries, Inc. Method of and apparatus for inspection of coatings on surfaces. 4,538,912, Cl. 356-366.000.

Shaw, Robert: *See*—
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Shea, Gregory T.; and Ballantyne, Ernest R., to Genoa Group Inc. Closure and valve for liquid container. 4,538,653, Cl. 141-285.000.

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Boom, Johannes; Terlouw, Teunis; and Visser, Pieter, deceased, 4,538,735, Cl. 209-691.000.
Broekhuis, Antonius A., 4,539,136, Cl. 525-250.000.

Shell Western F&P Inc.: *See*—
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Sheperd, Ervin M.: *See*—
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Shew, Shan W. Brightness and color regulatable lampshade. 4,539,630, Cl. 362-318.000.

Shibata, Kenji: *See*—
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Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Vane compressor having suction port and discharge port located at the same axial side thereof. 4,538,976, Cl. 418-133.000.

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Shigemasa, Takashi; and Ichikawa, Yoshinori, to Tokyo Shibaura Denki Kabushiki Kaisha. Digital PID process control apparatus. 4,539,633, Cl. 364-162.000.

Shigeta, Isamu: *See*—
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Shiiki, Kazuo: *See*—
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Shimakura, Yoshiteru: *See*—
Shimizu, Toshihide; Kaneko, Ichiro; and Shimakura, Yoshiteru, 4,539,230, Cl. 427-230.000.

Shimizu, Kazuo; Masaoka, Yoshiji; and Takaoka, Mutsuro, to Sanyo Kokusaku Pulp Co., Ltd. Film-forming composition comprising chlorinated polyalkylene glycol. 4,539,395, Cl. 528-425.000.

Shimizu, Masami: *See*—
Matsuyama, Shinichi; and Shimizu, Masami, 4,538,891, Cl. 354-289.100.

Shimizu, Toshihide; Kaneko, Ichiro; and Shimakura, Yoshiteru, to Shin-Etsu Chemical Co., Ltd. Method for preventing deposition of polymer scale and a coating agent therefor. 4,539,230, Cl. 427-230.000.

Shimohigashi, Katsuhiro; Masuda, Hiroo; Ikuzaki, Kunihiko; and Kawamoto, Hiroshi, to Hitachi, Ltd. Semiconductor memory. 4,539,658, Cl. 365-207.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Shimizu, Toshihide; Kaneko, Ichiro; and Shimakura, Yoshiteru, 4,539,230, Cl. 427-230.000.
Takago, Toshio; and Arai, Masatoshi, 4,539,418, Cl. 556-451.000.
Takamizawa, Minoru; Yamamoto, Akira; Ishihara, Toshinobu; and Ohshima, Mistuyoshi, 4,539,417, Cl. 556-435.000.

Shin International, Inc.: *See*—
Fearon, Edward R., 4,539,558, Cl. 340-572.000.

Shinagawa, Hiroshi: *See*—
Hidaka, Yoshiaki; and Shinagawa, Hiroshi, 4,538,565, Cl. 123-196.00R.

Shinoda, Naoharu; Tatani, Atsushi; Inoue, Kenji; and Okino, Susumu, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for the treatment of exhaust gases. 4,539,190, Cl. 423-240.000.

Shinzawa, Motohiro; Arai, Motomi; Roppongi, Shomatsu; Dozono, Kichihiko; and Hasegawa, Yoji, to Nissan Motor Company, Limited. Particle removing system for an internal combustion engine. 4,538,413, Cl. 60-303.000.

Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, to Murata Kikai Kabushiki Kaisha. Automatic system for conveying works in a machine shop. 4,538,950, Cl. 414-222.000.

Shionogi & Co., Ltd.: *See*—
Yamamoto, Sadao; Itani, Hikaru; Takahashi, Hiromi; Tsuji, Teruji; and Nagata, Wataru, 4,539,148, Cl. 260-239.00A.

Shipley Company Inc.: *See*—
Abu-Moustafa, Magda; and Valayil, Silvester P., 4,539,044, Cl. 106-1.230.

Shipman, Gene H., to Minnesota Mining and Manufacturing Co. Microporous sheet material, method of making and articles made therewith. 4,539,256, Cl. 428-315.500.

Shiragami, Kazuharu: *See*—
Deguchi, Masahiro; Moriya, Mitsuro; Wakami, Noboru; Goto, Yasuhiro; and Shiragami, Kazuharu, 4,539,664, Cl. 369-44.000.

Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, to Canon Kabushiki Kaisha. Amorphous silicon photoconductive member. 4,539,283, Cl. 430-61.000.

Shirakawa, Isao: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; and Shirakawa, Isao, 4,539,150, Cl. 260-239.30B.

Shiraki, Masao: *See*—
Kodama, Ikuo; Inoue, Masaharu; Shiraki, Masao; and Suzuki, Hajime, 4,538,650, Cl. 139-452.000.

Shirane, Hideto, to Fuji Photo Film Co., Ltd. Warning device for cameras. 4,538,894, Cl. 354-467.000.

Shiratani, Yusuke: *See*—
Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Hasegawa, Teruyuki; Nimura, Yoichi; and Hiraga, Noriyuki, 4,539,043, Cl. 266-265.000.

Shiroishi, Yoshihiro: *See*—
Yuito, Isamu; Shiiki, Kazuo; Saiki, Atsushi; Homma, Yoshio; Kumasaka, Noriyuki; Shiroishi, Yoshihiro; and Kudo, Mitsuhiro, 4,539,616, Cl. 360-125.000.

Shiroki Kinzoku Kogyo Kabushiki Kaisha: *See*—
Katsumoto, Naoaki; Ohshiro, Hideyuki; and Sakai, Masanori, 4,538,856, Cl. 297-367.000.

Shizuo, Inaba; Sato, Kiyoshi; Takahashi, Yoshio; and Takahashi, Hideyuki, to Pioneer Electronic Corporation. Automatic disc loading apparatus. 4,539,670, Cl. 369-77.100.

Shop-Vac Corporation: *See*—
Miller, Jonathan; Wacek, Rudolph W.; Berfield, Robert C.; Meland, Ronald F.; Crevling, Robert L., Jr.; and Lawson, Lonnie B., Jr., 4,538,971, Cl. 417-423.00A.

Shopsmith, Inc.: *See*—
Berkeley, James E., 4,538,655, Cl. 144-230.000.

Short, Lot W., Jr., to NL Industries, Inc. PDC cutter and bit. 4,538,690, Cl. 175-329.000.

Sick, Erwin, to Erwin Sick GmbH Optik-Elektronik. Optical apparatus for monitoring for thread breakage. 4,538,536, Cl. 112-273.000.

Sidhu, Pawitter S.; and Delgado, Gary M. Drive motor for shallow disk drive assembly. 4,539,611, Cl. 360-99.000.

Sidhu, Pawitter S.; and Delgado, Gary M. Spindle bearing assembly for disk drive unit. 4,539,612, Cl. 360-99.000.

Siegel, Hardo: *See*—
Degner, Dieter; Hannebaum, Heinz; Siegel, Hardo; and Gramlich, Walter, 4,539,081, Cl. 204-78.000.

Siemens Aktiengesellschaft: *See*—
Diederichs, Arthur, 4,538,345, Cl. 29-596.000.
Feuerbaum, Hans-Peter; and Schmitt, Reinhold, 4,539,477, Cl. 250-310.000.
Hahn, Helmuth; Cordt, Werner; and Borm, Winfried, 4,539,683, Cl. 371-15.000.
Heynisch, Hinrich; and Schmid, Eckart, 4,539,512, Cl. 315-5.350.
Kimpel, Rolf-Dieter; Stadler, Heinz; and Heinzl, Alfred, 4,539,540, Cl. 335-125.000.
Lenz, Michael, 4.539,529, Cl. 330-295.000.
Lorenz, Dieter, 4,539,449, Cl. 200-146.00R.
Lorenz, Dieter; and Rehaag, Benno, 4,539,450, Cl. 200-148.00F.
Nilsson, Kenth, 4,539,575, Cl. 346-140.00R.
Pfleiderer, Hans-Joerg; and Knauer, Karl, 4,539,537, Cl. 333-165.000.
Schulz, Winfried, 4,539,448, Cl. 200-144.0AP.
Schweiger, Josef; and Hering, Bernhard, 4,539,539, Cl. 335-78.000.
Troukens, Theo; and Mattelin, Antoon, 4,539,481, Cl. 250-557.000.
Walling, Christian; and Schott, Helmut, 4,539,696, Cl. 378-181.000.

Siemens-Allis, Inc.: *See*—
Stich, Frederick A., 4,539,618, Cl. 361-94.000.
Wagner, Paul D.; and Cooney, Edward F., 4,538,819, Cl. 277-4.000.

Sieminski, Richard: *See*—
Kennon, James L.; Sieminski, Richard; Sharpless, John; and Scharf, Donald, 4,538,542, Cl. 118-302.000.

Siewert, Wolfgang: *See*—
Mayr, Hermann; Kahmann, Albrecht; Lambrecht, Gerhard; Heinbockel, Wolfgang; Siewert, Wolfgang; and Maier, Josef, 4,538,765, Cl. 241-21.000.

SIG Schweizerische Industrie-Gesellschaft: *See*—
Muller, Werner, 4,538,399, Cl. 53-512.000.

Sigelman, Jesse L. Binocular ophthalmoscope. 4,538,888, Cl. 351-205.000.

Sigg, Hans: *See*—
Wegmann, Heinz; and Sigg, Hans, 4,538,449, Cl. 73-37.900.

Sigma Chemical Company: *See*—
Crider, Quincy E., 4,539,118, Cl. 210-683.000.

Silver Seiko Ltd.: *See*—
Nagashima, Yoshimitsu, 4,538,931, Cl. 400-185.000.

Simeth, Claus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Inking or damping unit for rotary printing machines. 4,538,514, Cl. 101-148.000.

Simm, Hans-Peter: *See*—
Ahlf, Heinz-Jurgen; Guhne, Wieland; Wulf, Peter; and Simm, Hans-Peter, 4,538,322, Cl. 15-387.000.

Simmons, Albert, to Molins PLC. Method and apparatus for determining the mass and moisture content of tobacco. 4,538,453, Cl. 73-73.000.

Simpson, Anthony; Peterkin, Stuart M.; Brooksby, Brian T.; and Murray, Harold J., to Detras Training Aids Limited. Target apparatus for weapon fire training. 4,538,991, Cl. 434-12.000.

Sinclair, J. Andrew, to Zimm Zamm AG. Shuttlecock. 4,538,818, Cl. 273-417.000.

Sindel, Allen W., to Combustion Engineering, Inc. Joining parallel faces of thick-walled structures by arc welding. 4,539,464, Cl. 219-137.00R.

Singer Company, The: *See*—
Summerfield, Anthony J., 4,538,992, Cl. 434-38.000.

Singh, Baldev: *See*—
Lesher, George Y.; and Singh, Baldev, 4,539,327, Cl. 514-342.000.

Singh, Jag J.; and Sprinkle, Danny R., to United States of America, National Aeronautics and Space Administration. Technique for measuring gas conversion factors. 4,538,446, Cl. 73-3.000.

Sintokogio Ltd.: *See*—
Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, 4,538,665, Cl. 164-160.100.

Siol, Werner; Klesse, Wolfgang; Suetterlin, Norbert; and Rauch, Hubert, to Rohm GmbH. Method for making polymodal aqueous synthetic resin dispersions. 4,539,361, Cl. 524-458.000.

Sipila , Raimo: *See*—
Fornas, Mikael; Sipila , Raimo; and Lehto, Altti, 4,539,027, Cl. 55-378.000.

Sipponen, Antti: *See*—
Kainulainen, Raimo; Sipponen, Antti; and Toivola, Tuomo, 4,539,241, Cl. 428-71.000.

Sirac SpA: *See*—
Filippini, Andrea; and Carobbi, Renato, 4,539,147, Cl. 260-112.50R.

Skarpness, Harold, to Gustafson, Inc. Pneumatic crosscut sampler. 4,538,472, Cl. 73-863.550.

Skil Nederland B.V.: *See*—
Houben, Jan P.; and Moolenaar, Antonie J., 4,539,500, Cl. 310-230.000.

Skowronski, Michael J.: *See*—
Hallmark, Richard K.; Skowronski, Michael J.; and Stephens, William D., 4,539,341, Cl. 521-172.000.

Skrabis, Thomas S.; and Jahn, Martin D., to Chicago Metallic Corporation. Metal building panels for wall applications. 4,538,391, Cl. 52-478.000.

Smart, William A., Jr.: *See*—
Barnum, Thomas G.; Smart, William A., Jr.; and Mullett, Donald H., 4,538,307, Cl. 4-427.000.

Smith, Clayton C.: *See*—
Barnett, Loren A.; and Smith, Clayton C., 4,538,387, Cl. 52-169.500.

Smith International, Inc.: *See*—
Muma, Brian C., 4,538,928, Cl. 384-96.000.

Smith, John W.: *See*—
Russ, James J.; and Smith, John W., 4,539,187, Cl. 423-132.000.

Smith Kline & French Laboratories Limited: *See*—
Brown, Thomas H.; and Ife, Robert J., 4,539,207, Cl. 514-272.000.

Smith, Raymond B.; and Tranter, Brian F., to Speedyplain Limited. Electronic musical chord calculator. 4,538,501, Cl. 84-478.000.

Smith, Walter E. Soft body guitar. 4,538,497, Cl. 84-291.000.

Smithson, G. Ronald. Electronically controlled interconnection system. 4,539,564, Cl. 340-825.790.

Smolik, Robert A. Magnetic template. 4,538,354, Cl. 408-72.00B.

Smuda, Robert T., to Combustion Engineering, Inc. Primary air duct cleaning apparatus for recovery boilers. 4,538,552, Cl. 122-387.000.

Snell, Clarence G. Flow metering tube insert and method. 4,538,470, Cl. 73-861.610.

Snyder General Corporation: *See*—
Hoeffken, Russell W.; and Wiese, John M., 4,538,338, Cl. 29-509.000.

Snyder, Richard H.: *See*—
Draxler, James R.; and Snyder, Richard H., 4,539,452, Cl. 200-334.000.

SO. CO. EN. S.r.l.: *See*—
Venturini, Andrea, deceased, 4,538,981, Cl. 431-190.000.

Sobolewski, Robert: *See*—
Markarian, Kegham M.; and Sobolewski, Robert, 4,538,669, Cl. 164-451.000.

Societe Degremont: *See*—
Durot, Jean; and Bernard, Jacques, 4,539,112, Cl. 210-219.000.

Soil Mate Equipment Ltd.: *See*—
Fortune, Douglas N.; and Ireland, Barry R., 4,538,625, Cl. 130-27.0JT.

Solloway, James H. Non-collapsible carrying kit. 4,538,727, Cl. 206-223.000.

Somerset Technologies, Inc.: *See*—
Aaron, Charles, 4,538,516, Cl. 101-219.000.

Son, Adelina J.; and Kuzlik, Mark S., to Halliburton Company. Corrosion inhibitor for heavy brines. 4,539,122, Cl. 252-8.55R.

Sony Corporation: *See*—
Fujiie, Kazuhiko, 4,539,667, Cl. 369-50.000.
Higashihara, Teruaki, 4,539,671, Cl. 369-213.000.
Miyazaki, Takahiro, 4,539,266, Cl. 428-695.000.
Ogawa, Hiroshi; and Yamagami, Tamotsu, 4,539,691, Cl. 375-37.000.
Takeda, Masashi; and Iwasa, Masaru, 4,539,553, Cl. 340-347.0DA.
Takeuchi, Hajime; and Okuyama, Yoshikazu, 4,539,603, Cl. 360-10.100.
Tanaka, Yutaka; Ikeda, Yasunari; and Nakano, Hiroshi, 4,539,592, Cl. 358-140.000.
Wachi, Shigeaki, 4,539,666, Cl. 369-50.000.
Yazawa, Kenji; and Baba, Kenichi, 4,539,264, Cl. 428-621.000.
Yazawa, Kenji, 4,539,265, Cl. 428-621.000.

Sorensen, Jens O., to Primtec. Displaced snorkel sandwich molding. 4,539,171, Cl. 264-328.800.

Sorensen, Kim: *See*—
Henrichsen, Frank; Hansen, Flemming A.; and Sorensen, Kim, 4,538,988, Cl. 433-84.000.

Sorensen, Maurice L. Chimney cleaning apparatus. 4,538,317, Cl. 15-163.000.

Sotinee Tolvay, Marta: *See*—
Orban, Erno ; Borvendeg, Janos; Nagy, Laszlo ; Sotinee Tolvay, Marta; and Bander, Erzsebet, 4,539,199, Cl. 424-22.000.

Soumiya, Norimasa, to Ricoh Company, Ltd. Electrophotographic copier with a phantom image suppression function. 4,538,901, Cl. 355-14.00E.

Soussaline, Francoise: *See*—
Le Coq, Gerard; and Soussaline, Francoise, 4,539,639, Cl. 364-414.000.

Spackova, Daniela S.; and Chen, Richard M. Previewer. 4,539,585, Cl. 358-93.000.

Speedyplain Limited: *See*—
Smith, Raymond B.; and Tranter, Brian F., 4,538,501, Cl. 84-478.000.

Speidel, Joachim, to Tekade Felten & Guillaume Fernmeldeanlagen GmbH. Automatic and adaptive digital nonlinear decision feedback equalizer. 4,539,690, Cl. 375-14.000.

Spider Staging, Inc.: *See*—
Leivestad, Ole E., 4,538,705, Cl. 182-142.000.

Spivack, John D.; Pastor, Stephen D.; and Odorisio, Paul, to Ciba-Geigy Corporation. 1H-Polyalkyl-phosphorinanes. 4,539,421, Cl. 560-105.000.

Sprague, Robert A.; and Turner, William D., to Xerox Corporation. Conformable electrodes for proximity coupled electro-optic devices. 4,538,883, Cl. 350-356.000.

Springen, Clyde H.: *See*—
Clearman, Melvin R.; and Springen, Clyde H., 4,539,703, Cl. 382-28.000.

Springer, Gilbert D., to Ferix Corporation. Method for creating magnetic toner images having controlled toner distribution. 4,539,280, Cl. 430-39.000.

Sprinkle, Danny R.: *See*—
Singh, Jag J.; and Sprinkle, Danny R., 4,538,446, Cl. 73-3.000.

Stack, Eugene V., to Dow Chemical Company, The. Plastic lined diaphragm valve. 4,538,638, Cl. 137-375.000.

Stack, Gary P.; and Moyer, John A., to American Home Products Corporation. β-Carboline anticonvulsants. 4,539,407, Cl. 546-87.000.

Staco Stapelmann GmbH: *See*—
Pinger, Egon; and Stapelmann, Jan W., 4,539,457, Cl. 219-58.000.

Stadler, Heinz: *See*—
Kimpel, Rolf-Dieter; Stadler, Heinz; and Heinzl, Alfred, 4,539,540, Cl. 335-125.000.

Stahlecker, Fritz: *See*—
Stahlecker, Gerd, 4,538,328, Cl. 19-0.250.

Stahlecker, Gerd, to Stahlecker, Fritz; and Stahlecker, Hans. Device for interrupting feed of a roving to a drawing frame. 4,538,328, Cl. 19-0.250.

Stahlecker, Hans: *See*—
Stahlecker, Gerd, 4,538,328, Cl. 19-0.250.

Stamberger, Paul, to Union Carbide Corporation. Half-ester adducts and polymer-polyols useful in the preparation of improved plastics, including polyurethane foams, elastomers and the like. 4,539,340, Cl. 521-157.000.

Stamicarbon B.V.: *See*—
Kleintjens, Ludovicus A. L.; and Grooten, Hubertus M. J., 4,539,425, Cl. 562-412.000.

Standard Oil Company (Indiana): *See*—
Kelterborn, Jeffrey C.; and Stone, Richard A., 4,539,097, Cl. 208-11.0LE.

Standard Telephones and Cables, Public Limited Company: *See*—
Gray, Edmund, 4,539,620, Cl. 361-275.000.

Staneshin, Anatoly V.: *See*—
Nosal, Vsevolod V.; Rybakov, Jury V.; Golovkin, Viktor T.; Novokreschenov, Mikhail M.; Lysikov, Boris V.; and Staneshin, Anatoly V., 4,538,350, Cl. 29-825.000.

Stanich, Mikel J.: *See*—
Higgins, Robert C.; Stanich, Mikel J.; and Wolfe, Larry L., 4,538,895, Cl. 355-3.00R.

Stanwicks, Peter L.: *See*—
Paskowski, Frank J., Jr.; and Stanwicks, Peter L., 4,538,768, Cl. 241-101.200.

Stapelmann, Jan W.: *See*—
Pinger, Egon; and Stapelmann, Jan W., 4,539,457, Cl. 219-58.000.

Starkston, Robert; Luce, Mark C.; and Homsy, Robert V., to Chevron Research Company. Method for removing sulfides from industrial gas. 4,539,189, Cl. 423-220.000.
Starkstrom-Apparatebau GmbH: *See—*
Rapp, Werner, 4,539,544, Cl. 335-296.000.
Staudenmayer, Ralph: *See—*
Whanger, James R.; and Staudenmayer, Ralph, 4,539,018, Cl. 51-295.000.
Staudte, Juergen H.: *See—*
Juptner, William F.; Macy, David F.; and Staudte, Juergen H., 4,538,461, Cl. 73-505.000.
Steck, George L., to Steck Manufacturing Co., Inc. Dolly. 4,538,796, Cl. 269-17.000.
Steck Manufacturing Co., Inc.: *See—*
Steck, George L., 4,538,796, Cl. 269-17.000.
Stehning, Werner; and Nusser, Horst D., to Gottfried Bischoff Bau kompl. Gasreinigungs -und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesells-haft. Scrubber for the desulfurization of flue gases. 4,539,024, Cl. 55-223.000.
Stehning, Werner, to Gottfried Bischoff Bau Kompl. Gasreinigungaund Wasserruckkuhlanlagen GmbH. Scrubber for the desulfurization of exhaust gases. 4,539,184, Cl. 422-170.000.
Stein, Paul J.; and Gibson, Rodney W., to U.S. Philips Corporation. Tone detection arrangement. 4,539,646, Cl. 364-484.000.
Steinberg, Fritz: *See—*
Hudspeth, Thomas; Rosen, Harold A.; and Steinberg, Fritz, 4,539,681, Cl. 370-119.000.
Steinhaus, Harald; and Meiners, Detlef, to Kopp GmbH International Pipeline Services. Method of drying long-distance pipelines in sections. 4,538,359, Cl. 34-21.000.
Stellar Energy Ststems, Inc.: *See—*
Townsend, Donald W.; and Routery, Edward E., 4,538,886, Cl. 350-630.000.
Stenberg, Erik G., to KMW Aktiebolag. Method and apparatus for detecting and counteracting a deformation of the stock discharge gap in a headbox of a paper machine. 4,539,074, Cl. 162-198.000.
Stengle, Edward J.: *See—*
Burzynski, Alfred J.; and Stengle, Edward J., 4,539,232, Cl. 427-387.000.
Stephens, William D.: *See—*
Hallmark, Richard K.; Skowronski, Michael J.; and Stephens, William D., 4,539,341, Cl. 521-172.000.
Sterling Drug Inc.: *See—*
Bailey, Denis M., 4,539,429, Cl. 514-658.000.
Lesher, George Y.; and Singh, Baldev, 4,539,327, Cl. 514-342.000.
Stern, Bruce A.: *See—*
Hirschbuehler, Kevin R.; and Stern, Bruce A., 4,539,253, Cl. 428-229.000.
Sternad, Peter: *See—*
Esper, Friedrich; Friese, Karl-Hermann; Gohl, Walter; and Sternad, Peter, 4,539,503, Cl. 313-11.500.
Stevens, Curtis E., to Parker-Hannifin Corporation. Optical-hydraulic control system. 4,538,633, Cl. 137-85.000.
Stich, Bodo; Hassler, Ernst; and Adamowicz, Slawomir, to Glyco Antriebstechnik GmbH. Vane-type oil pump for automotive vehicle. 4,538,974, Cl. 418-26.000.
Stich, Frederick A., to Siemens-Allis, Inc. Digitally controlled overload relay. 4,539,618, Cl. 361-94.000.
Stirling, Irene: *See—*
Clarke, Brian P.; Harbridge, John B.; and Stirling, Irene, 4,539,202, Cl. 424-114.000.
Stix, Wolfgang: *See—*
Nouvertne , Werner; and Stix, Wolfgang, 4,539,370, Cl. 525-67.000.
Stobbe, Jens M. D. Suspension rack for bags and sacks, in particular refuse disposal bags for domestic purposes. 4,538,783, Cl. 248-99.000.
Stock, Norman A.: *See—*
Wisnia, Jack; and Stock, Norman A., 4,538,769, Cl. 241-179.000.
Stoll, Ulrich W. Method and apparatus for measuring the strength of hardened concrete. 4,538,467, Cl. 73-803.000.
Stone, Kenneth. Diffusion device for flash gun. 4,539,624, Cl. 362-16.000.
Stone, Richard A.: *See—*
Kelterborn, Jeffrey C.; and Stone, Richard A., 4,539,097, Cl. 208-11.0LE.
Storage Technology Corporation: *See—*
Hill, John P.; and Touchton, James J., 4,539,608, Cl. 360-77.000.
Stormberg, Hans P.: *See—*
Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., 4,539,513, Cl. 315-176.000.
Strande, Per: *See—*
Benneche, Tore; Strande, Per; and Undheim, Kjell, 4,539,324, Cl. 514-274.000.
Strata Bit Corporation: *See—*
Dennis, Mahlon D., 4,538,691, Cl. 175-393.000.
Straub, Harry: *See—*
Brady, Joseph H.; Koenig, Albert A.; and Straub, Harry, 4,538,834, Cl. 285-10.000.
Straubel, Max; Eisele, Hermann; Leblanc, Jean; and Pigeroulet, Jean, to Robert Bosch GmbH. Fuel injection pump. 4,538,580, Cl. 123-494.000.
Streater, Richard W.: *See—*
Este, Grantley O.; Suthers, Mark S.; and Streater, Richard W., 4,539,502, Cl. 310-313.00B.
Street, William D., to SFE Technologies, Inc. Method for manufacture of selectively coated carrier plate. 4,538,346, Cl. 29-602.00R.
Stromberg, Lars A., to Studsvik Energiteknik AB. Fast fluidized bed boiler and a method of controlling such a boiler. 4,538,549, Cl. 122-4.00D.
Strong, Robert T.: *See—*
Boston, William G.; and Strong, Robert T., 4,539,102, Cl. 209-38.000.
Strothmann, Rolf; and Dohmer, Rolf, to Unitron Industries Ltd. Plugs, receptacles and hearing aids. 4,539,439, Cl. 179-107.00R.
Stubbs, John K.: *See—*
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,539,322, Cl. 514-253.000.
Studsvik Energiteknik AB: *See—*
Stromberg, Lars A., 4,538,549, Cl. 122-4.00D.
Suehiro, Tsutomu: *See—*
Itatani, Hiroshi; Kashima, Mikito; and Suehiro, Tsutomu, 4,539,423, Cl. 560-204.000.
Suetterlin, Norbert: *See—*
Siol, Werner; Klesse, Wolfgang; Suetterlin, Norbert; and Rauch, Hubert, 4,539,361, Cl. 524-458.000.
Suga, Masaaki: *See—*
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,539,643, Cl. 364-431.090.
Sugar Research Limited: *See—*
Reichard, Stefan R., 4,538,451, Cl. 73-61.00R.
Suggs, Louis F. Wave and tide powered generation apparatus. 4,539,484, Cl. 290-53.000.
Sugino, Shigemi; Sasaki, Kenichi; and Iwasa, Yoshio, to Nissan Motor Company, Limited. Compression control system for an internal combustion engine and control method therefor. 4,538,569, Cl. 123-316.000.
Sugio, Takashi; Obata, Makoto; and Ito, Shotaro, to Matsushita Electric Industrial Co., Ltd. Impeller for cross-flow fan. 4,538,963, Cl. 416-203.000.
Sugisawa, Taijiro; and Tanase, Teruyoshi, to Mitsubishi Kinzoku Kabushiki Kaisha. Surface coated Sialon-base ceramic materials for tools. 4,539,251, Cl. 428-216.000.
Sugo, Takanobu: *See—*
Ishigaki, Isao; Sugo, Takanobu; and Okamoto, Jiro, 4,539,277, Cl. 429-249.000.
Suhadolnik, Robert J.; Wu, Joseph M.; Doetsch, Paul; and Henderson, Earl E., to Research Corporation. (2'-5')-Oligo (3'-deoxyandenylate) and derivatives thereof. 4,539,313, Cl. 514-47.000.
Sullivan, James B.: *See—*
Fox, Richard B.; and Sullivan, James B., 4,538,787, Cl. 249-112.000.
Sumal, Jaihind S.: *See—*
Gneiss, Heinz; and Sumal, Jaihind S., 4,538,457, Cl. 73-204.000.
Sumitomo Chemical Company, Limited: *See—*
Takahashi, Yukoh; Yachigo, Shinichi; and Ishii, Tamaki, 4,539,355, Cl. 524-131.000.
Sumitomo Durez Company, Ltd.: *See—*
Nishimura, Toshiaki, 4,539,343, Cl. 523-145.000.
Sumitomo Electric Industries, Ltd.: *See—*
Takenaka, Shinya; and Sunago, Katsuyoshi, 4,538,609, Cl. 128-303.100.
Tomita, Kazuichi; Mano, Hiroshi; Matsuyama, Fumio; and Isomura, Akihiko, 4,539,113, Cl. 210-323.200.
Yamanishi, Toru; Tsuneishi, Katsuyuki; and Yoshida, Masaaki, 4,539,219, Cl. 427-32.000.
Sumitomo Metal Industries, Ltd.: *See—*
Hara, Senri; Tomono, Hiroshi; Kimura, Tomohiko; Inoue, Kunio; Sato, Takayuki; and Okada, Yoshio, 4,538,667, Cl. 164-418.000.
Summerfield, Anthony J., to Singer Company, The. Image pick-up assembly for a vehicle training simulator. 4,538,992, Cl. 434-38.000.
Sumner, Maurice N., to McNally Pittsburg, Inc. Conveyor shifting apparatus and process. 4,538,722, Cl. 198-861.200.
Sunago, Katsuyoshi: *See—*
Takenaka, Shinya; and Sunago, Katsuyoshi, 4,538,609, Cl. 128-303.100.
Sunder, Swaminathan; and Miller, Robert N., to Air Products and Chemicals, Inc. Extraction of depolymerized carbonaceous material using supercritical ammonia. 4,539,094, Cl. 208-8.0LE.
Sunder, Swaminathan; and Miller, Robert N., to Air Products and Chemicals, Inc. Aqueous alkali depolymerization of coal with a quinone. 4,539,095, Cl. 208-8.0LE.
Sunderland & South Shields Water Company: *See—*
Redshaw, Norman L., 4,539,557, Cl. 340-539.000.
Sundholm, Goran. Connection for joining a pipe having a flared end to a fixed connection piece, such as a pump. 4,538,835, Cl. 285-12.000.
Sundquist, Carl R. Solar collector. 4,538,592, Cl. 126-450.000.
Suply, Patrick: *See—*
Valentin, Jean; Suply, Patrick; and Detrier, Stephane, 4,538,652, Cl. 141-57.000.
Surf-Jet Corporation: *See—*
Inwood, Thomas J., 4,538,996, Cl. 440-38.000.
Suthers, Mark S.: *See—*
Este, Grantley O.; Suthers, Mark S.; and Streater, Richard W., 4,539,502, Cl. 310-313.00B.
Suyama, Satoshi; Uehira, Kiyotaka; Sanpei, Kenji; Sakamoto, Kenichi; and Nakagawa, Koichiro, to Matsushita Electric Industrial Co., Ltd. Loading apparatus for a recording medium. 4,539,613, Cl. 360-99.000.
Suzuka, Susumu: *See—*
Kaneko, Kazuo; Gonda, Michihiro; Suzuka, Susumu; and Kitsukawa, Katsumasa, 4,539,577, Cl. 346-207.000.
Suzuki, Atsushi; Ninomiya, Masakazu; and Maeda, Katuya, to Nippondenso Co., Ltd. Air-fuel ratio control for an internal combustion engine. 4,538,578, Cl. 123-478.000.

Suzuki, Hajime: *See*—
Kodama, Ikuo; Inoue, Masaharu; Shiraki, Masao; and Suzuki, Hajime, 4,538,650, Cl. 139-452.000.

Suzuki, Kuniaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal printing system. 4,539,571, Cl. 346-76.0PH.

Suzuki, Kunihiko, to Nissan Motor Co., Ltd. Four-wheel drive system with deceleration-responsive center differential control. 4,538,700, Cl. 180-248.000.

Suzuki, Mamoru; and Tanaka, Hiromoto, to Tokyo Electric Power Company Inc., The; and Mitsubishi Denki Kabushiki Kaisha. Training simulator for training an operator in the operation of an electric power system. 4,538,994, Cl. 434-219.000.

Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, to Nissan Motor Company, Limited. Fuel cut-off control system in fuel injection internal combustion engine with automatic power transmission. 4,539,643, Cl. 364-431.090.

Suzuki, Yoshio: *See*—
Morimoto, Junichi; Kawamura, Fumio; Watanabe, Akira; Suzuki, Yoshio; and Kawamura, Masamichi, 4,539,282, Cl. 430-59.000.

Svecia Silkscreen Maskiner AB: *See*—
Ericsson, Sylve J. D., 4,538,358, Cl. 34-4.000.

Svensson, Lars T. E.: *See*—
Carlqvist, Bengt R.; and Svensson, Lars T. E., 4,539,674, Cl. 370-32.000.

Swain, R. L. Bibb. Vapor compression distillation system. 4,539,076, Cl. 202-154.000.

Swan, Clarence B.: *See*—
Bosch, Fridolin L.; and Swan, Clarence B., 4,539,686, Cl. 372-26.000.

Swartz, Robert G.: *See*—
Jarvis, John F.; Swartz, Robert G.; and Wooley, Bruce A., 4,539,554, Cl. 345-365.00A.

Sweeney, William M., to Texaco Inc. Process for treating gasoline or gasohol by contact with KF or K_2CO_3. 4,539,013, Cl. 44-56.000.

Sweeney, William M., to Texaco Inc. Low flash point diesel fuel of increased conductivity containing amyl alcohol. 4,539,014, Cl. 44-56.000.

Swerdloff, Michael D.; Van Der Puy, Michael; Kolc, Jaroslav F.; Rogic, Milorad M.; and Hendrickson, Larry L., to Allied Corporation. Urease inhibited urea based fertilizer compositions containing N-aryl-N-aliphatic phosphorotriamide compounds. 4,539,037, Cl. 71-28.000.

Swift, Gregory W.: *See*—
Wheatley, John C.; Swift, Gregory W.; and Migliori, Albert, 4,538,464, Cl. 73-646.000.

Swiss Aluminium Ltd.: *See*—
Wulff, Gunther, 4,539,561, Cl. 340-675.000.

Syntex Pharmaceuticals International Limited: *See*—
Tsuchihashi, Gen-Ichi; Mitamura, Shuichi; and Kitajima, Koji, 4,539,420, Cl. 560-056.000.

Synthetic Breakwater: *See*—
Wingfield, William R., 4,539,078, Cl. 204-1.00R.

Systems Engineering & Manufacturing Corp.: *See*—
Fishman, Herbert; and Rogers, Alvin J., 4,539,069, Cl. 156-640.000.

Szabo, Bela: *See*—
Takacs, Istvan; Kerey, Gyorgy; Rudolf, Peter; Illes, Janos; Szabo, Bela; Vereczkey, Endre; Banos, Zoltan; Bosits, Gyula; and Czebe, Laszlo , 4,539,111, Cl. 210-179.000.

Szala, Lawrence E.: *See*—
Brun, Milivoj K.; Lee, Minyoung; and Szalá, Lawrence E., 4,539,141, Cl. 252-516.000.
Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., 4,539,299, Cl. 501-96.000.

Szucs, Robert J.; and McNicholas, Sandra M., to Ingersoll Products Corp. Fluted coulter blade. 4,538,688, Cl. 172-555.000.

Tachikawa Corporation: *See*—
Tomita, Katsuaki, 4,538,662, Cl. 160-107.000.

Tada, Atuki: *See*—
Ishibashi, Masaya; Tada, Atuki; and Kanda, Jun, 4,539,663, Cl. 369-34.000.

Tadokoro, Eiichi: *See*—
Ryoke, Katsumi; Masuyama, Kenichi; Yoneyama, Takashi; Nasu, Norio; and Tadokoro, Eiichi, 4,539,257, Cl. 428-323.000.

Taguchi, Eiji: *See*—
Nomura, Toshio; Taguchi, Eiji; and Aoi, Tomio, 4,538,577, Cl. 123-452.000.

Taig, Alistair G., to Allied Corporation. Mechanical brake control device. 4,538,710, Cl. 192-13.00A.

Tajima, Hatsuo; Takahashi, Tohru; and Hosono, Nagao, to Canon Kabushiki Kaisha. Unit for an image formation apparatus and image formation apparatus provided with the same unit. 4,538,896, Cl. 355-3.00R.

Tajiri, Norikiyo: *See*—
Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, 4,539,662, Cl. 369-13.000.

Takacs, Istvan; Kerey, Gyorgy; Rudolf, Peter; Illes, Janos; Szabo, Bela; Vereczkey, Endre; Banos, Zoltan; Bosits, Gyula; and Czebe, Laszlo , to Richter Gedeon Vegyeszeti Gyar Rt. Extraction apparatus. 4,539,111, Cl. 210-179.000.

Takada, Toshio: *See*—
Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, 4,539,129, Cl. 252-62.630.

Takagi, Kunihiko: *See*—
Sakamoto, Izumi; and Takagi, Kunihiko, 4,539,234, Cl. 427-393.500.

Takagi, Masahiro: *See*—
Miyakawa, Tsutomu; Yamane, Junji; Takagi, Masahiro; Arai, Tomoyoshi; Tanaka, Haruhiko; Morita, Yuji; and Sakurai, Satoshi, 4,539,669, Cl. 369-75.200.

Takagi, Mikio; Takasaki, Kanetake; and Koyama, Kenji, to Fujitsu Limited. Vapor phase growth method. 4,539,068, Cl. 156-614.000.

Takagi, Satoshi: *See*—
Hayashi, Hideki; Takagi, Satoshi; Ito, Yukio; and Endo, Sadayoshi, 4,538,753, Cl. 226-199.000.

Takagi, Toshinori: *See*—
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,539,054, Cl. 148-403.000.

Takago, Toshio; and Arai, Masatoshi, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of pentamethylcyclotrisiloxane. 4,539,418, Cl. 556-451.000.

Takahashi, Hideyuki: *See*—
Shizuo, Inaba; Sato, Kiyoshi; Takahashi, Yoshio; and Takahashi, Hideyuki, 4,539,670, Cl. 369-77.100.

Takahashi, Hiromi: *See*—
Yamamoto, Sadao; Itani, Hikaru; Takahashi, Hiromi; Tsuji, Teruji; and Nagata, Wataru, 4,539,148, Cl. 260-239.00A.

Takahashi, Kenji: *See*—
Kohda, Katsuhiro; and Takahashi, Kenji, 4,539,137, Cl. 252-301.40H.
Miyahara, Junji; Nakamura, Takashi; and Takahashi, Kenji, 4,539,138, Cl. 252-301.40H.

Takahashi, Shuichi; Kondo, Mitsuru; and Yuasa, Kazuhiro, to Ricoh Company, Ltd. Image signal processing with a variable threshold. 4,539,600, Cl. 358-282.000.

Takahashi, Tohru: *See*—
Tajima, Hatsuo; Takahashi, Tohru; and Hosono, Nagao, 4,538,896, Cl. 355-3.00R.

Takahashi, Yoshio: *See*—
Shizuo, Inaba; Sato, Kiyoshi; Takahashi, Yoshio; and Takahashi, Hideyuki, 4,539,670, Cl. 369-77.100.

Takahashi, Yukoh; Yachigo, Shinichi; and Ishii, Tamaki, to Sumitomo Chemical Company, Limited. Phosphorus-containing compounds, their production and their use as antioxidants. 4,539,355, Cl. 524-131.000.

Takahata, Yoshiro, to Hondadenshigiken Co., Ltd. Optical switch for an automatic door. 4,539,474, Cl. 250-221.000.

Takahori, Hiroyuki: *See*—
Nishioka, Akira; Kawanabe, Yoshihiro; Takahori, Hiroyuki; and Fujimoto, Hideki, 4,539,491, Cl. 307-297.000.

Takai, Kazuki, to Clarion Co., Ltd. Pack guide mechanism. 4,539,610, Cl. 360-93.000.

Takama, Kenichirou: *See*—
Oishi, Kiyohiko; Ishida, Yasuhiko; and Takama, Kenichirou, 4,538,412, Cl. 60-288.000.

Takamisawa Electric Co., Ltd.: *See*—
Fujii, Kunishisa; Yoshino, Kosei; and Nakazawa, Masami, 4,539,543, Cl. 335-281.000.

Takamizawa, Masae; Kan, Shigenobu; and Mukainakano, Masato, to Honda Giken Kogyo Kabushiki Kaisha. Control lever assembly in a self-propelled lawn mower. 4,538,401, Cl. 56-11.800.

Takamizawa, Minoru; Yamamoto, Akira; Ishihara, Toshinobu; and Ohshima, Mistuyoshi, to Shin-Etsu Chemical Co., Ltd. Poly(dimethylsilmethylene) methylacetylene compound and a method for the preparation thereof. 4,539,417, Cl. 556-435.000.

Takano, Motoharu, to Kewpie Kabushiki Kaisha. Method and apparatus for cutting off top seal parts of containers made of synthetic resin. 4,538,489, Cl. 82-71.000.

Takaoka, Mutsuro: *See*—
Shimizu, Kazuo; Masaoka, Yoshiji; and Takaoka, Mutsuro, 4,539,395, Cl. 528-425.000.

Takasaki, Kanetake: *See*—
Takagi, Mikio; Takasaki, Kanetake; and Koyama, Kenji, 4,539,068, Cl. 156-614.000.

Takata, Terasu; and Inoue, Haruo, to Ogura Clutch Co. Ltd. Power transmission device easy to mount on a driver. 4,538,711, Cl. 192-18.00R.

Takebe, Kaoru: *See*—
Tanaka, Susumu; and Takebe, Kaoru, 4,539,281, Cl. 430-45.000.

Takeda Chemical Industries, Ltd.: *See*—
Nohara, Akira; and Kuzuna, Seiji, 4,539,326, Cl. 514-285.000.

Takeda, Keiso, to Toyota Jidosha Kabushiki Kaisha. Air intake device of an internal combustion engine. 4,538,556, Cl. 123-52.0MB.

Takeda, Masashi; and Iwasa, Masaru, to Sony Corporation. Digital-to-analog converter of the current-adding type. 4,539,553, Cl. 340-347.0DA.

Takeda Riken Co., Ltd.: *See*—
Kitayoshi, Hitoshi, 4,539,518, Cl. 324-77.00B.

Takeda, Yasuo: *See*—
Takeshita, Kazuhisa; and Takeda, Yasuo, 4,539,056, Cl. 156-183.000.

Takei, Toshihiro; Hattori, Yoshiyuki; and Ohnishi, Shunsaku, to Nippondenso Co., Ltd. Fuel pump having regenerative section provided with vent housing for voltex flow. 4,538,958, Cl. 415-53.00T.

Takenaka, Shinya; and Sunago, Katsuyoshi, to Sumitomo Electric Industries, Ltd. Manipulator for laser knife. 4,538,609, Cl. 128-303.100.

Takeno, Hidekazu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko;

Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,539,155, Cl. 260-112.50R.
Takenoya, Hideaki; and Mishima, Fumiyuki, to Janome Sewing Machine Industry Co., Ltd. Wire-dot impact type printer. 4,538,932, Cl. 400-185.000.
Takeshima, Takahiko; Akemoto, Haruo; and Iwai, Hideki, to UBE Industries, Ltd. Gas venting arrangement incorporated into a mold. 4,538,666, Cl. 164-305.000.
Takeshita, Kazuhisa; and Takeda, Yasuo, to Ajinomoto Co., Inc.; and Nippon Printing Co., Ltd. Release sheet and a method for making thereof. 4,539,056, Cl. 156-183.000.
Takeuchi, Hajime; and Okuyama, Yoshikazu, to Sony Corporation. Video signal reproducing device. 4,539,603, Cl. 360-10.100.
Takezawa, Keiji, to Alps Electric Co., Ltd. Sliding rheostat with slider element having calibration means. 4,539,546, Cl. 338-176.000.
Takita, Ichiro: *See*—
Kaneko, Toshiaki; Takita, Ichiro; and Shikano, Hiroshi, 4,539,301, Cl. 501-99.000.
Tamura, Yorikazu; Sadanobu, Jiro; and Nakamura, Tsutomu, to Teijin Limited. Dimensionally stable poly-m-phenylene isophthalamide film. 4,539,393, Cl. 528-348.000.
Tanaka, Haruhiko: *See*—
Miyakawa, Tsutomu; Yamane, Junji; Takagi, Masahiro; Arai, Tomoyoshi; Tanaka, Haruhiko; Morita, Yuji; and Sakurai, Satoshi, 4,539,669, Cl. 369-75.200.
Tanaka, Hirokazu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,539,155, Cl. 260-112.50R.
Tanaka, Hiromoto: *See*—
Suzuki, Mamoru; and Tanaka, Hiromoto, 4,538,994, Cl. 434-219.000.
Tanaka, Shinichi; and Hirose, Namio, to Matsushita Electric Industrial Co., Ltd. Two-dimensional suspension. 4,538,882, Cl. 350-255.000.
Tanaka, Shuji: *See*—
Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; Inoue, Teruhiko; and Oomori, Kiyosi, 4,539,403, Cl. 544-326.000.
Tanaka, Susumu; and Takebe, Kaoru, to Minolta Camera Kabushiki Kaisha. Method of forming dichromatic copy images. 4,539,281, Cl. 430-45.000.
Tanaka, Yoshiaki: *See*—
Hayakawa, Isao; and Tanaka, Yoshiaki, 4,539,401, Cl. 544-101.000.
Tanaka, Yutaka; Ikeda, Yasunari; and Nakano, Hiroshi, to Sony Corporation. Double-scanning non-interlace television receiver. 4,539,592, Cl. 358-140.000.
Tanaka, Yutaka: *See*—
Sato, Keishi; Nishida, Takeshi; Kamiya, Toji; and Tanaka, Yutaka, 4,539,255, Cl. 428-252.000.
Tanase, Teruyoshi: *See*—
Sugisawa, Taijiro; and Tanase, Teruyoshi, 4,539,251, Cl. 428-216.000.
Tang, Ching W.: *See*—
VanSlyke, Steven A.; and Tang, Ching W., 4,539,507, Cl. 313-504.000.
Taprogge Gesellschaft GmbH: *See*—
Patzig, Dieter, 4,539,115, Cl. 210-409.000.
Tardy, John, to AT&T Technologies, Inc. Apparatus for testing the integrity of an electrical coil as it is wound. 4,538,771, Cl. 242-7.120.
Tarjan, Peter P., to Cordis Corporation. Method for lead introduction and fixation. 4,538,624, Cl. 128-784.000.
Tark, Sung Y.: *See*—
Lipson, Melvin A.; Derrico, Gene A.; Tark, Sung Y.; and Yamazaki, Toshio, 4,539,286, Cl. 430-277.000.
Tasc Ltd.: *See*—
Fry, Bradley; and Wexler, Alvin, 4,539,640, Cl. 364-414.000.
Tatani, Atsushi: *See*—
Shinoda, Naoharu; Tatani, Atsushi; Inoue, Kenji; and Okino, Susumu, 4,539,190, Cl. 423-240.000.
Taylor, Edward F., to General Motors Corporation. Aerodynamic rear view mirror. 4,538,851, Cl. 296-1.00S.
Taylor, Lloyd D., to Polaroid Corporation. Temporary polymeric mordants containing acetoxybenzyl substituted quaternary ammonium groups. 4,539,383, Cl. 526-304.000.
Taylor, Thomas M.: *See*—
Giacopelli, James N.; McElroy, James D.; and Taylor, Thomas M., 4,539,437, Cl. 179-18.0ES.
Tazawa, Hiroaki: *See*—
Mori, Teijiro; Wada, Yuichi; Nishisako, Shizutaka; Tazawa, Hiroaki; and Masuda, Shigeru, 4,539,451, Cl. 200-147.00R.
TDK Corporation: *See*—
Ishino, Ken; Hashimoto, Yasuo; and Narumiya, Yoshikazu, 4,539,433, Cl. 174-35.0MS.
Tecumseh Products Company: *See*—
Lowery, David C.; and Alyea, Robert W., 4,538,701, Cl. 181-274.000.
Tedeschi, Robert J.; and Diuguid, Lincoln I. Burning efficiency enhancement method. 4,539,015, Cl. 44-77.000.
Tefka, Edward E. Fire and smoke protection device for use in buildings. 4,539,555, Cl. 340-500.000.
Tegal Corporation: *See*—
Zajac, John P., 4,539,062, Cl. 156-345.000.
Teijin Limited: *See*—
Kiriyama, Tsutomu; Horie, Shigeru; Ichihashi, Tetsuo; and Oshida, Masahiro, 4,539,389, Cl. 528-272.000.
Sasaki, Yoshiyuki; Kobayashi, Shigenobu; Okamoto, Tetsuo; and Minemura, Norihiro, 4,539,242, Cl. 428-92.000.
Tamura, Yorikazu; Sadanobu, Jiro; and Nakamura, Tsutomu, 4,539,393, Cl. 528-348.000.
Tekade Felten & Guillaume Fernmeldeanlagen GmbH: *See*—
Speidel, Joachim, 4,539,690, Cl. 375-14.000.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Boudault, Robert, 4,539,693, Cl. 375-110.000.
Teledyne Republic Manufacturing: *See*—
Acker, Richard C., 4,538,640, Cl. 137-596.000.
Telefonaktiebolaget LM Ericsson: *See*—
Carlqvist, Bengt R.; and Svensson, Lars T. E., 4,539,674, Cl. 370-32.000.
Jaki, Ivan, 4,539,443, Cl. 179-170.00D.
TELEFUNKEN electronic GmbH: *See*—
Rodenheber, Rainer, 4,538,572, Cl. 123-418.000.
Temelli, Sedat, to Vereinigte Kesselwerke AG. Garbage incinerator. 4,538,529, Cl. 110-244.000.
Teng, Clarence: *See*—
Pollack, Gordon P.; Teng, Clarence; and Hunter, William R., 4,538,343, Cl. 29-576.00W.
Teradyne, Inc.: *See*—
Johnson, Lennart B., 4,538,866, Cl. 339-17.0LM.
Terlouw, Teunis: *See*—
Boom, Johannes; Terlouw, Teunis; and Visser, Pieter, deceased, 4,538,735, Cl. 209-691.000.
Texaco Inc.: *See*—
Cuscurida, Michael; Yeakey, Ernest L.; and Peterson, Bruce W., 4,539,339, Cl. 521-137.000.
Cuscurida, Michael; and Yeakey, Ernest L., 4,539,378, Cl. 525-407.000.
MacLean, John P.; Bittensky, Joel S.; and Colvert, James H., 4,539,303, Cl. 502-39.000.
Sweeney, William M., 4,539,013, Cl. 44-56.000.
Sweeney, William M., 4,539,014, Cl. 44-56.000.
Texas Instruments Incorporated: *See*—
Bayraktaroglu, Burhan; Kim, Bumman; and Frensley, William, 4,539,528, Cl. 330-287.000.
Clearman, Melvin R.; and Springen, Clyde H., 4,539,703, Cl. 382-28.000.
Pollack, Gordon P.; Teng, Clarence; and Hunter, William R., 4,538,343, Cl. 29-576.00W.
Sharpe, Claude A.; and Ho, Cecil C., 4,539,566, Cl. 343-389.000.
Trenkler, George; and Delagi, Richard G., 4,538,756, Cl. 228-118.000.
Textile Products, Incorporated: *See*—
Curzio, Frederick H., 4,539,249, Cl. 428-175.000.
Textron, Inc.: *See*—
Miller, Thomas P., 4,538,586, Cl. 123-620.000.
Thalman, Bernal C.: *See*—
Artinano, Antonio T.; Jimenez, Hernan N.; Thalman, Bernal C.; and Vasquez, Marco A. E., 4,539,480, Cl. 250-551.000.
Thanner, Otto: *See*—
Huber, Johann; and Thanner, Otto, 4,538,384, Cl. 51-322.000.
The, Hans L.: *See*—
Michaelis, Walfried; Fanger, Hans-Ulrich; and The, Hans L., 4,539,649, Cl. 364-558.000.
Theis, Peter F. Programmed conversation recording system. 4,539,436, Cl. 179-6.040.
Therm-O-Type Corporation: *See*—
Van Pelt, Christopher K., 4,538,801, Cl. 271-251.000.
Theurer, Josef; and Folser. Karl, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast cleaning machine. 4,538,686, Cl. 171-16.000.
Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Arrangement for excavating and conveying bulk material. 4,538,687, Cl. 171-16.000.
Thewlis, Alan, to International Computers Limited. Electrical connectors. 4,538,870, Cl. 339-75.00M.
Theysohn, Rainer: *See*—
Pipper, Gunter; Theysohn, Rainer; and Zahradnik, Franz, 4,539,391, Cl. 528-323.000.
Thomas & Betts Corporation: *See*—
Wilson, Albert H.; and Sadigh-Behzadi, Amir-Akbar, 4,538,867, Cl. 339-17.0CF.
Thomas Jefferson University: *See*—
Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, 4,539,698, Cl. 381-70.000.
Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, 4,539,699, Cl. 381-70.000.
Thomas, Mark S.: *See*—
Thomas, Stephen E.; and Thomas, Mark S., 4,539,496, Cl. 310-68.00B.
Thomas, Stephen E.; and Thomas, Mark S. Externally mounted generators for pneumatic wheels. 4,539,496, Cl. 310-68.00B.
Thomas, Terence N.; and Hogeboom, John G., to Northern Telecom Limited. Phase locked loop variable oscillator with switched capacitors. 4,539,531, Cl. 331-11.000.
Thompson-CSF: *See*—
Trong, Linh N.; and Chevrier, Jean, 4,539,501, Cl. 310-313.00A.
Thompson, Herbert E., to Drivetec, Inc. Flexible magnetic disk clamping an injector mechanism. 4,539,614, Cl. 360-99.000.

Thompson, James E.; and Broaddus, Charles D., to Procter & Gamble Company, The. Peroxygen bleach activators and bleaching compositions. 4,539,130, Cl. 252-94.000.
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Thompson, Marion E. Solar battery energizer. 4,539,516, Cl. 320-48.000.
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Davies, Stephen P.; and Thompson, Morice W., 4,539,362, Cl. 524-458.000.
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., to Petrolite Corporation. Pyrimidines containing sulfur and amino groups as corrosion inhibitors. 4,539,404, Cl. 544-335.000.
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Thorne, Gary H., to National Mine Service Company. Rock duster apparatus. 4,538,941, Cl. 406-143.000.
Thornton, Ken O. Irrigation system. 4,538,377, Cl. 47-1.00R.
Thurman, Truman D. Snap cravet necktie and knot form. 4,538,302, Cl. 2-150.000.
Thyssengas G.m.b.H.: *See*—
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, 4,539,016, Cl. 48-197.00R.
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Tokyo Juki Industrial Co., Ltd.: *See*—
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Ariizumi, Shoji; and Segawa, Makoto, 4,539,490, Cl. 307-296.00R.
Donuma, Kenichi; Ohashi, Makoto; and Ozeki, Takeshi, 4,539,476, Cl. 250-227.000.
Fujiki, Masao, 4,539,607, Cl. 360-77.000.
Fujita, Yasuhiko; and Masuda, Eiji, 4,539,551, Cl. 340-347.0AD.
Izumi, Yutaka; and Kawakami, Hiroshi, 4,539,668, Cl. 369-75.200.
Komeya, Katsutoshi; Tsuge, Akihiko; Inoue, Hiroshi; and Ohta, Hiroyasu, 4,539,298, Cl. 501-89.000.
Kuromaru, Akira, 4,539,582, Cl. 357-71.000.
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Matsunaga, Junichi, 4,539,580, Cl. 357-23.000.
Okumura, Katsuya; and Ueda, Masaaki, 4,538,344, Cl. 29-589.000.
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Tomita, Toyofumi, 4,538,468, Cl. 73-861.170.
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Yamagata, Ichiro; and Sato, Shinsaku, 4,538,957, Cl. 415-1.000.
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Tomita, Katsuaki, to Tachikawa Corporation. Window having double-glazed sliding doors and blinds. 4,538,662, Cl. 160-107.000.
Tomita, Kazuichi; Mano, Hiroshi; Matsuyama, Fumio; and Isonura, Akihiko, to Sumitomo Electric Industries, Ltd. Fluororesin filter. 4,539,113, Cl. 210-323.200.
Tomita, Toyofumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electromagnetic flowmeter. 4,538,468, Cl. 73-861.170.
Tomka, Ivan: *See*—
Wittwer, Fritz; and Tomka, Ivan, 4,539,060, Cl. 156-275.100.
Tomoegawa Paper Manufacturing Company Limited: *See*—
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Tomono, Hiroshi: *See*—
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Abe, Koichi; Kawakami, Kenichi; Yoshii, Toshiya; and Inoue, Toshihide, 4,539,260, Cl. 428-336.000.
Kadoi, Sho; and Aya, Toshihiko, 4,539,392, Cl. 528-336.000.
Touchton, James J.: *See*—
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Townsend, Donald W.; and Routery, Edward E., to Stellar Energy Ststems, Inc. Circular arc solar concentrator. 4,538,886, Cl. 350-630.000.
Toyo Seikan Kaisha Limited: *See*—
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Toyoda Koki Kabushiki Kaisha: *See*—
Doi, Yoshio; Yamakage, Tetsuro; Nakashima, Kunimichi; and Matsuura, Akihiro, 4,538,341, Cl. 29-568.000.
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Toyoda, Shuhei: *See*—
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Kurusu, Toshiro; and Ishii, Hakumi, 4,538,477, Cl. 74-493.000.
Oishi, Kiyohiko; Ishida, Yasuhiko; and Takama, Kenichirou, 4,538,412, Cl. 60-288.000.
Sato, Hiroki; Toyoda, Shuhei; Yokoya, Yuji; and Ishii, Hakumi, 4,538,478, Cl. 74-493.000.
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Trager, Seymour F.; and Chylinski, Victoria S., to Ketchum & Co. Inc. Imidazolidinyl urea and derivatives thereof for use in opthalmic solutions. 4,539,330, Cl. 514-398.000.
Tran, Danh C.; and Fisher, Chester, to Geo-Centers, Inc. SF_6 Process for dehydration of fluoride glasses. 4,539,032, Cl. 65-32.000.
Transkinetics Systems, Inc.: *See*—
Dinsmore, Mark T., 4,539,710, Cl. 455-134.000.
Transworld Drilling Company: *See*—
Johnson, Jerry R., 4,538,939, Cl. 405-205.000.
Tranter, Brian F.: *See*—
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Trenkler, George; and Delagi, Richard G., to Texas Instruments Incorporated. Process for producing reinforced structural members. 4,538,756, Cl. 228-118.000.
Triangle Package Machinery Co.: *See*—
Klopfenstein, King L.; Connors, Robert H.; and Bergholt, Steven P., 4,538,693, Cl. 177-25.000.
Trikilis, Theodore N., to P I E International Inc. Publication. 4,538,833, Cl. 281-2.000.
Trimedyne, Inc.: *See*—
Mittleman, Herbert, 4,538,918, Cl. 366-160.000.
Trindle, James J. Bicycle pedal and shoe. 4,538,480, Cl. 74-594.500.
Trioliet-Mullos Silo Nederland B.V.: *See*—
Liet, Cornelis H.; and Liet, Fredericus, 4,538,949, Cl. 414-24.600.
Trong, Linh N.; and Chevrier, Jean, to Thompson-CSF. Epitaxial structure with increased piezoelectric effect and a surface acoustic wave electronic device comprising such a structure. 4,539,501, Cl. 310-313.00A.
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Opitz, Wolfgang; Jacobi, Haireddin; and Pelster, Bernhard, 4,539,402, Cl. 544-247.000.
Troukens, Theo; and Mattelin, Antoon, to Siemens Aktiengesellschaft. Method for adjusting a reference signal for a laser device operating in a giant pulse mode. 4,539,481, Cl. 250-557.000.
Trussell, Gerald C.; Felix, Andre B.; Hembree, Thomas D.; and Rollins, Paul F., to Phoenix Digital Corporation. Microcomputer based distributed control network. 4,539,655, Cl. 364-900.000.
Trutek Research Inc.: *See*—
Nowacki, Christopher; and Brisson, Alfred G., 4,538,620, Cl. 128-725.000.
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TRW Inc.: *See*—
Updike, Stanley H.; Michaels, William A.; and Kuonen, Frederick L., 4,538,558, Cl. 123-90.300.
Tse, Hing C., to Procter & Gamble Co., The. Process for preparing tea products. 4,539,216, Cl. 426-597.000.
Tsuchihashi, Gen-Ichi; Mitamura, Shuichi; and Kitajima, Koji, to Syntex Pharmaceuticals International Limited. Optically active 1-aromatic-group-substituted-1-alkanones and methods for their manufacture. 4,539,420, Cl. 560-056.000.
Tsuge, Akihiko: *See*—
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Tsuruoka, Shingo, to Hino Jidosha Kogyo Kabushiki Kaisha. Combustion chamber in a diesel engine. 4,538,566, Cl. 123-276.000.
Tucker, Annabelle D. Angio-catheter/infusion tubing lock. 4,539,003, Cl. 604-93.000.

Tuggle, William E. Wheel for land vehicles and method for moving such vehicles over soft or irregular surfaces. 4,538,657, Cl. 152-375.000.
Turner, David: *See—*
Schutten, Herman P.; Hoppie, Lyle O.; Turner, David; and Chute, Richard, 4,538,642, Cl. 137-625.280.
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Tymkewicz, John; Phillips, Robert L.; and Park, Richard M., to Marlin Manufacturing Corporation. Printing machine with programmed control of print cylinder motor and web tractor feed motor. 4,538,515, Cl. 101-216.000.
UBE Industries, Ltd.: *See—*
Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; Inoue, Teruhiko; and Oomori, Kiyosi, 4,539,403, Cl. 544-326.000.
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Ulrich, Reinhard; and Rashleigh, Scott C., to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Fiber optics device for measuring the intensity of an electric current utilizing the Faraday effect. 4,539,519, Cl. 324-117.00R.
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United Aircraft Products, Inc.: *See—*
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Agriculture: *See—*
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Lee, Kien-yin, 4,539,430, Cl. 564-511.000.
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Willer, Rodney L., 4,539,405, Cl. 544-367.000.
U.S. Philips Corporation: *See—*
Dumont, Daniel, 4,539,659, Cl. 365-226.000.
Einhaus, Hermanus F., 4,539,672, Cl. 369-244.000.
Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., 4,539,513, Cl. 315-176.000.
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United Technologies Corporation: *See—*
Hart, Richard A.; and Bartkowski, Charles, 4,539,685, Cl. 372-25.000.
Sederquist, Richard A., 4,539,267, Cl. 429-17.000.
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Unitika Ltd.: *See—*
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Unitron Industries Ltd.: *See—*
Strothmann, Rolf; and Dohmer, Rolf, 4,539,439, Cl. 179-107.00R.
Universite Paris VII: *See—*
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University of California, The Regents of the: *See—*
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University of Texas System: *See—*
Zermeno, Alfonso; Marsh, Lee M., Jr.; and Cowart, Ronald W., 4,539,591, Cl. 358-335.000.
Updike, Stanley H.; Michaels, William A.; and Kuonen, Frederick L., to TRW Inc. Valve rotating device. 4,538,558, Cl. 123-90.300.
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Jarczyn, Henry N., 4,538,621, Cl. 128-748.000.
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Usry, Joe D.; Bunnell, James B.; and Faddis, Chris G., to Bunnel Life Systems, Inc. System for assisting respiration. 4,538,604, Cl. 128-204.230.
Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, to Sintokogio Ltd. Molding box apparatus. 4,538,665, Cl. 164-160.100.
V.S.I. Corporation: *See—*
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Valentin, Jean; Suply, Patrick; and Detrier, Stephane, to Etablissements F. Valentin. Device for incorporating a dose of liqueur in a bottle of champagnized wine. 4,538,652, Cl. 141-57.000.
Vallese, Eleanor R., executrix: *See—*
Lindner, Robert W.; and Vallese, Lucio M., deceased, 4,539,589, Cl. 358-113.000.
Vallese, Lucio M., deceased: *See—*
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Valyocsik, Ernest W., to Mobil Oil Corporation. Synthesis of crystalline silicate ZSM-12. 4,539,193, Cl. 423-328.000.
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Lutus, Arthur C.; and van Blerk, Victor B., 4,538,900, Cl. 355-14.0CH.
Vandenbergh, John G. Drink can measuring and can crushing device. 4,538,459, Cl. 73-379.000.
Vandenbussche, Joseph, to Constructie Werkhuizen Vandekerckhove N.V. Process and apparatus for crushing raw materials. 4,538,766, Cl. 241-30.000.
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Vandewalle, Maurits; Vanmaele, Luc J.; De Clercq, Pierre J.; Halkes, Sebastianus J.; and Overbeek, Wilhelmus R. M., to Duphar International Research B.V. Method of preparing 1 α-hydroxyvitamin D and 1 α-hydroxyprevitamin D compounds, and adducts of a previtamin D or tachysterol compound with a suitable dienophile. 4,539,153, Cl. 260-397.200.
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Van Iperen, Willem H. P., to Sea-Land Corporation. Removable garment rack for transport of hanging garments. 4,538,738, Cl. 211-162.000.
Van John, John W. Energy alternating swing method. 4,538,802, Cl. 272-1.00R.
Van Lue, Benjamin H.; Van Lue, Timothy A.; and Vanlue, Vincent V. Bean cutter. 4,538,492, Cl. 83-411.00R.
Van Lue, Timothy A.: *See—*
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Van Ornum, Joel V.; and Chiu, Jessie T., to Rockcor, Inc. Thermally stable sealant composition. 4,539,344, Cl. 523-166.000.

Van Pelt, Christopher K., to Therm-O-Type Corporation. Paper sheet handling mechanism. 4,538,801, Cl. 271-251.000.
VanSlyke, Steven A.; and Tang, Ching W., to Eastman Kodak Company. Organic electroluminescent devices having improved power conversion efficiencies. 4,539,507, Cl. 313-504.000.
Van Steenwyk, William E.: *See—*
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Vargo, William R. Safety mezzanine gate. 4,538,379, Cl. 49-381.000.
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Baines, Patrick A., 4,539,705, Cl. 383-8.000.
Venturini, Andrea, deceased (by Venturini, Antonio, Silvana Venturini nee Salea, Rossella Venturini, heirs), to SO. CO. EN. S.r.l. Combustion catalyzing system for commercial grade fuels. 4,538,981, Cl. 431-190.000.
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Khachaturian, Jon E.; and Charles, Joseph P., 4,538,849, Cl. 294-81.100.
Vest, Rolf: *See—*
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Otake, Yoshichi, 4,539,584, Cl. 358-44.000.
Vig, John R., to United States of America, Army. Method of minimizing the aging rate of an oscillator. 4,539,532, Cl. 331-69.000.
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Mouzin, Gilbert; Cousse, Henri; and Vilain, Pol, 4,539,413, Cl. 549-366.000.
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Vilutis, Leonard J., 4,539,236, Cl. 428-35.000.
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Vindez, Pierre G., to P.V. Tool, Inc. Positive feed drill with stop control. 4,538,942, Cl. 408-14.000.
Vine, Raymond W.; Schroll, Craig R.; and Reiser, Carl A., to United Technologies Corporation. Molten carbonate fuel cell matrix tape and assembly method. 4,538,348, Cl. 29-623.100.
Visser, Antonia Jacoba, nee Van der Heide, legal representative: *See—*
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Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., 4,539,209, Cl. 426-3.000.
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Vogl, Dennis A. Shutoff valve for fuel truck or tanker drain off downspouts. 4,538,632, Cl. 137-77.000.
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von Schuckmann, Alfred. Dispenser for the portioned dispensing of, in particular, pasty masses. 4,538,747, Cl. 222-260.000.
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Ahlf, Heinz-Jurgen; Guhne, Wieland; Wulf, Peter; and Simm, Hans-Peter, 4,538,322, Cl. 15-387.000.
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Jacob, Herbert; Rurlander, Robert; and Schnegg, Anton, 4,539,221, Cl. 427-53.100.
Kramler, Josef; Kuhn-Kuhnenfeld, Franz; and Gerber, Hans-Adolf, 4,539,050, Cl. 148-1.500.
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Wade, Wallace R.; and Rao, Vemulapalli Durga N., to Ford Motor Company. Automatic initiation system for regenerating a particulate filter trap. 4,538,411, Cl. 60-274.000.
Wagener, Hans, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Movable fuse socket support for use on bus bars. 4,538,879, Cl. 339-22.00B.
Wagner, George M., to Occidental Chemical Corporation. Non-blooming fire retardants for wood substrates. 4,539,045, Cl. 106-18.130.
Wagner, Paul D.; and Cooney, Edward F., to Siemens-Allis, Inc. Lead gasket for electric motors. 4,538,819, Cl. 277-4.000.
Wakabayashi, Tsutomu; and Furuya, Mikihito, to Nippon Kogaku K.K. Device for connecting printed wiring boards or sheets. 4,538,865, Cl. 339-17.00F.
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Walling, Christian; and Schott, Helmut, to Siemens Aktiengesellschaft. Target device for an X-ray examination installation. 4,539,696, Cl. 378-181.000.
Wallon, Bernard: *See—*
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Method and apparatus for manufacturing single crystals. 4,539,067, Cl. 156-601.000.

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Watanabe, Minoru, to Kabushiki Kaisha Murakoshi Seiko. Locking device for door. 4,538,844, Cl. 292-127.000.

Watanabe, Takashi; Ozawa, Masakazu; Koizumi, Yutaka; and Matsumoto, Haruyuki, to Canon Kabushiki Kaisha. Ink jet recording apparatus. 4,539,569, Cl. 346-140.00R.

Waterstrat, Richard M., to American Dental Association Health Foundation. Arc furnace for the production of small investment castings of reactive or refractory metals such as titanium. 4,538,671, Cl. 164-514.000.

Watkins, Joseph J.: *See—*
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Wattenhofer, Jean-Pierre, to ASULAB S.A. Non-linear counting circuit. 4,539,694, Cl. 377-42.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
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Weber, Sylvester A., to Westinghouse Electric Corp. Spar type consumable electrodes for vacuum arc melting of zirconium or titanium alloys. 4,539,688, Cl. 373-67.000.

Webster, Donald R., to Pacific Scientific Company. Particulate sample analyzing instrument employing vibration to compact the sample. 4,538,908, Cl. 356-36.000.

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Weekley, Robert E.: *See—*
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Melotik, Donald J.; Weintraub, Marvin H.; and Anderson, Arnold E., 4,539,233, Cl. 427-388.100.

Weissenborn, Jorg. Device for supplying material with unit doses of parasiticidal composition. 4,538,744, Cl. 222-36.000.

Weissman, Bernard, to Ipco Corporation. Dental die tray assembly. 4,538,987, Cl. 433-60.000.

Welch Allyn Inc.: *See—*
Danna, Dominick; Wheeler, Robert C.; and English, Stanley R., 4,539,586, Cl. 358-98.000.

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Welter, Charles J. Top carrier for a convertible jeep-type vehicle. 4,538,752, Cl. 224-309.000.

Wenger, Helmut, to Zangl GmbH. Electrically heated cutting tool. 4,539,467, Cl. 219-233.000.

Wessel, Wolf: *See—*
Buck, Rainer; Engel, Gerhard; Kuttner, Thomas; Sautter, Wilfried; and Wessel, Wolf, 4,538,571, Cl. 123-357.000.

West Point Foundry & Machine Co.: *See—*
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Westendorf, Neal W.: *See—*
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Bharteey, Brit M.; and Rowe, Neal E., 4,539,541, Cl. 335-132.000.
Bosna, Alexander A., 4,539,465, Cl. 219-137.700.
Ciliberti, David F.; and Lippert, Thomas E., 4,539,025, Cl. 55-302.000.
Flick, Robert H.; and Huffman, Walter K., 4,539,538, Cl. 335-16.000.
Kalkbrenner, Ralph W.; and Kobuck, Richard M., 4,538,956, Cl. 414-735.000.
Miller, Coleman J.; and Barron, Robert R., 4,539,535, Cl. 333-164.000.
Plankenhorn, Daniel J., 4,539,462, Cl. 219-121.0LV.
Weber, Sylvester A., 4,539,688, Cl. 373-67.000.

Westman, Jan-Erik, to AB Volvo. Conveyor. 4,538,721, Cl. 198-774.000.

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Whanger, James R.; and Staudenmayer, Ralph, to Hughes Tool Company—USA. Method of manufacturing cutter elements for drill bits. 4,539,018, Cl. 51-295.000.

Wheatley, John C.; Swift, Gregory W.; and Migliori, Albert, to United States of America, Energy. Method of measuring reactive acoustic power density in a fluid. 4,538,464, Cl. 73-646.000.

Wheeler, Robert C.: *See—*
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White, Stanley A., to Rockwell International Corporation. Parameter-setting approach to obtain high performance CTD transversal filters from devices with significant CTI and FPN. 4,539,536, Cl. 333-165.000.

White, William L., to United States of America, National Aeronautics and Space Administration. Dual towline spin-recovery device. 4,538,778, Cl. 244-75.00R.

Whited, Robert E. Endotracheal tube. 4,538,606, Cl. 128-207.150.

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Wigoda, Luis T. Arbitration of tennis by change of colors. 4,538,811, Cl. 273-31.000.

Wiklund, Per M., to Trateknik Centrum. Method for sawing a log or a block into pieces of lumber. 4,538,656, Cl. 144-378.000.

Wilbanks International, Inc.: *See—*
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Wilkes, Robert D., to Jacuzzi Inc. Support system for a submersible D.C. motor. 4,539,498, Cl. 310-87.000.

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Williams, Albert L.: *See—*
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Williams, Bob J.; and Brors, Daniel L., to Eaton Corporation. Mask structure for X-ray lithography and method for making same. 4,539,278, Cl. 430-5.000.

Williams, Gwynne: *See—*
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Williams International Corporation: *See—*
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Williams, Marvin E.; Chaney, David B.; and Rebele, Donald J., to Huntington National Bank, The. Wheeled garment bag. 4,538,709, Cl. 190-18.00A.

Williams, Peter C.; Koch, Ulrich H.; Yusko, Edward M., Jr.; and Mannion, Thomas M., to Whitey Co. Valve stem packing assembly. 4,538,790, Cl. 251-214.000.

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Wilson, Albert H.; and Sadigh-Behzadi, Amir-Akbar, to Thomas & Betts Corporation. Socket assembly connector for an electrical component. 4,538,867, Cl. 339-17.0CF.

Wilson, Charles R.; Buss, Waldeen C.; and Field, Leslie A., to Chevron Research Company. Pretreatment method for enhancing the selectivity and increasing the stability of a reforming catalyst. 4,539,305, Cl. 502-66.000.

Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., to International Flavors & Fragrances Inc. Food flavoring use of hexynyl alkanoates. 4,539,209, Cl. 426-3.000.

Wilson, Ross E., to Morette's Limited. Elevator chair. 4,538,854, Cl. 297-345.000.

Wilson, Verne H.; Blaser, Lawrence M.; and Arguello, Leonard E., to Fairchild Camera & Instrument Corporation. Dynamic ignition apparatus. 4,538,585, Cl. 123-609.000.

Winchell, David A.; and Fowles, Thomas A., to Baxter Travenol Laboratories, Inc. Method of blowmolding a container having an integral inner dispensing outlet. 4,539,172, Cl. 264-515.000.

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Winslow, John S., to Optical Disc Corporation. Optical disc air separation method and device. 4,539,673, Cl. 369-284.000.

Winter, Maurice J.; and Dawe, Peter R., to Ranks Hovis McDougall p.l.c. Method of producing pasta. 4,539,214, Cl. 426-557.000.

Wirfelt, Sven A. O., to Sandvik AB. Means for actuating the throttle of a pivotably mounted chain saw. 4,538,494, Cl. 83-796.000.

Wise, James C., to Harris Graphics Corporation. Signature handling apparatus. 4,538,511, Cl. 100-7.000.

Wisebaker, Robert E., to National Machinery Company, The. Forging machine kickout drive with running adjustment. 4,538,437, Cl. 72-345.000.

Wisnia, Jack; and Stock, Norman A., to Dominion Engineering Works Limited. Grinding mill construction. 4,538,769, Cl. 241-179.000.

Witt, Wolfram; and Moll, Manfred, to Rheinmetall GmbH. Warhead unit. 4,538,519, Cl. 102-387.000.

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Wong, Nang C., to Dow Chemical Company, The. Olefin polymer barrier films and methods for use thereof. 4,538,531, Cl. 111-1.000.

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Wostal, Terry K., to Norse Leasing Corp. Valve mechanism for a livestock watering bowl. 4,538,791, Cl. 251-339.000.

Wright, Ian G., to Eli Lilly and Company. Process for preparing cephalosporin intermediates. 4,539,422, Cl. 560-155.000.

Wu, Chyi-Ying. Collapsible storage box for floppy disk. 4,538,730, Cl. 206-444.000.

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Wulff, Gunther, to Swiss Aluminium Ltd. Process and device for inspecting the surface of a material. 4,539,561, Cl. 340-675.000.

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Yamada, Steve. Frame straightening device. 4,538,444, Cl. 72-447.000.

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Yamagata, Ichiro; and Sato, Shinsaku, to Tokyo Shibaura Denki Kabushiki Kaisha. Multi-stage hydraulic machine and control method for multi-stage hydraulic machine. 4,538,957, Cl. 415-1.000.

Yamagata, Toshitaka, to Amada Company, Limited. Nozzle and power-feed element for wire-cut electrical discharge machine. 4,539,459, Cl. 219-69.00W.

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Yamamoto, Sadao; Itani, Hikaru; Takahashi, Hiromi; Tsuji, Teruji; and Nagata, Wataru, to Shionogi & Co., Ltd. Production of 1-oxacephams and intermediates. 4,539,148, Cl. 260-239.00A.

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Miyakawa, Tsutomu; Yamane, Junji; Takagi, Masahiro; Arai, Tomoyoshi; Tanaka, Haruhiko; Morita, Yuji; and Sakurai, Satoshi, 4,539,669, Cl. 369-75.200.

Yamanishi, Toru; Tsuneishi, Katsuyuki; and Yoshida, Masaaki, to Sumitomo Electric Industries, Ltd. Method for coating optical transmission glass fibers. 4,539,219, Cl. 427-32.000.

Yamauchi, Junichi: *See*—
Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, 4,539,382, Cl. 526-276.000.

Yamazaki Machiner Works, Ltd.: *See*—
Sakai, Takayoshi; Mizoguchi, Kiyohisa; and Hayakawa, Masazumi, 4,539,634, Cl. 364-167.000.

Yamazaki, Shigeru: *See*—
Arai, Takao; Yamazaki, Shigeru; Kanazawa, Yasunori; and Noguchi, Takaharu, 4,539,615, Cl. 360-121.000.

Yamazaki, Toshio: *See*—
Lipson, Melvin A.; Derrico, Gene A.; Tark, Sung Y.; and Yamazaki, Toshio, 4,539,286, Cl. 430-277.000.

Yang, Wen-Liang. Faucet with built-in needle valve. 4,538,646, Cl. 137-883.000.

Yangas, Roger. Method and means for improving microwave cooking. 4,539,454, Cl. 219-10.55F.

Yanmar Diesel Engine Co., Ltd.: *See*—
Amemori, Koichi; Kawabe, Toshihiko; and Miyazaki, Manabu, 4,538,561, Cl. 123-90.440.

Yasuda, Tomio: *See*—
Hashimoto, Akio; and Yasuda, Tomio, 4,538,698, Cl. 180-79.100.

Yasui, Hideo; and Miki, Yasuhiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for producing a coagulated latex of spherical configuration. 4,539,396, Cl. 528-481.000.

Yasui, Hideo: *See*—
Ohchi, Torao; and Yasui, Hideo, 4,538,533, Cl. 112-239.000.

Yazawa, Kenji; and Baba, Kenichi, to Sony Corporation. Magnetic recording medium. 4,539,264, Cl. 428-621.000.

Yazawa, Kenji, to Sony Corporation. Magnetic recording medium. 4,539,265, Cl. 428-621.000.

Yeager, Raymond W.; and Oberg, Bradley W., to Owens-Corning Fiberglas Corporation. Insulation and partition means for existing building. 4,538,390, Cl. 52-221.000.

Yeakey, Ernest L.: *See*—
Cuscurida, Michael; Yeakey, Ernest L.; and Peterson, Bruce W., 4,539,339, Cl. 521-137.000.
Cuscurida, Michael; and Yeakey, Ernest L., 4,539,378, Cl. 525-407.000.

Yeazel, Kenneth L.; and Forester, Robert J., to Crane Carrier Company. Chassiless vehicle and front refuse loader. 4,538,951, Cl. 414-407.000.

Yeda Research and Development Co., Ltd.: *See*—
Sagiv, Jacob, 4,539,061, Cl. 156-278.000.

Yokota, Mitsuyoshi: *See*—
Morishita, Mitsuharu; Yokota, Mitsuyoshi; and Matsumoto, Akio, 4,539,515, Cl. 320-17.000.

Yokoya, Yuji: *See*—
Sato, Hiroki; Toyoda, Shuhei; Yokoya, Yuji; and Ishii, Hakumi, 4,538,478, Cl. 74-493.000.

Yomoda, Minoru; and Tsukamoto, Izumi, to Canon Kabushiki Kaisha. Transfer apparatus for compensating for a transfer error. 4,538,914, Cl. 356-400.000.

Yoneyama, Takashi: *See*—
Ryoke, Katsumi; Masuyama, Kenichi; Yoneyama, Takashi; Nasu, Norio; and Tadokoro, Eiichi, 4,539,257, Cl. 428-323.000.

Yoon, Hyun-Nam, to Celanese Corporation. Process for forming thermally stable thermotropic liquid crystalline polyesters of predetermined chain length. 4,539,386, Cl. 528-183.000.

Yoshida, Hiroshi: *See*—
Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; Inoue, Teruhiko; and Oomori, Kiyosi, 4,539,403, Cl. 544-326.000.

Yoshida, Masaaki: *See*—
Yamanishi, Toru; Tsuneishi, Katsuyuki; and Yoshida, Masaaki, 4,539,219, Cl. 427-32.000.

Yoshida, Yosuke, to Kabushiki Kaisha Daini Seikosha. Test circuit for watch LSI. 4,538,923, Cl. 368-70.000.

Yoshii, Toshiya: *See*—
Abe, Koichi; Kawakami, Kenichi; Yoshii, Toshiya; and Inoue, Toshihide, 4,539,260, Cl. 428-336.000.

Yoshimitsu, Arata: *See*—
Nishihara, Hisakatsu; and Yoshimitsu, Arata, 4,538,668, Cl. 164-448.000.

Yoshino, Kosei: *See*—
Fujii, Kunishisa; Yoshino, Kosei; and Nakazawa, Masami, 4,539,543, Cl. 335-281.000.

Yuasa, Kazuhiro: *See*—
Takahashi, Shuichi; Kondo, Mitsuru; and Yuasa, Kazuhiro, 4,539,600, Cl. 358-282.000.

Yudovich, Amos, to Phillips Petroleum Company. Upgrading carbonaceous materials. 4,539,098, Cl. 208-11.0LE.

Yuito, Isamu; Shiiki, Kazuo; Saiki, Atsushi; Homma, Yoshio; Kumasaka, Noriyuki; Shiroishi, Yoshihiro; and Kudo, Mitsuhiro, to Hitachi, Ltd. Thin film magnetic head and fabricating method thereof. 4,539,616, Cl. 360-125.000.

Yusko, Edward M., Jr.: *See*—
Williams, Peter C.; Koch, Ulrich H.; Yusko, Edward M., Jr.; and Mannion, Thomas M., 4,538,790, Cl. 251-214.000.

Zagoroff, Dimiter S. Shrink oven. 4,538,363, Cl. 34-225.000.

Zahradnik, Franz: *See*—
Pipper, Gunter; Theysohn, Rainer; and Zahradnik, Franz, 4,539,391, Cl. 528-323.000.

Zajac, John P., to Tegal Corporation. Modular plasma reactor with local atmosphere. 4,539,062, Cl. 156-345.000.

Zak, Chet, to Post Machinery Company, Inc. Control apparatus for trailing edge folder in carton folding machine. 4,539,002, Cl. 493-23.000.

Zampino, Michael J.: *See*—
Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., 4,539,209, Cl. 426-3.000.

Zandbergen, Teun: *See*—
Sarin, Sohan L.; and Zandbergen, Teun, 4,539,245, Cl. 428-116.000.

Zangl GmbH: *See*—
Wenger, Helmut, 4,539,467, Cl. 219-233.000.

Zapolski, Bronislaw: *See*—
Zeller, Noel E.; and Zapolski, Bronislaw, 4,538,983, Cl. 431-255.000.

Zaucha, Ronald J.: *See*—
Nixon, Bryan E.; Ward, Donald W.; and Zaucha, Ronald J., 4,539,169, Cl. 264-171.000.

Zeidl, Horst J., to TRW Automotive Products, Inc. Frame corner. 4,538,936, Cl. 403-402.000.

Zeller, Noel E.; and Zapolski, Bronislaw, to Zeller, Noel E. Foldable safety lighter. 4,538,983, Cl. 431-255.000.

Zenith Electronics Corporation: *See*—
Lehnert, Stanley E., 4,539,488, Cl. 307-261.000.

Zermeno, Alfonso; Marsh, Lee M., Jr.; and Cowart, Ronald W., to University of Texas System. Method of impressing and reading out a surface charge on a multi-layered detector structure. 4,539,591, Cl. 358-335.000.

Zetzsche, Friedbert: *See*—
Meyer, Dieter; Rossmann, Christian; and Zetzsche, Friedbert, 4,539,117, Cl. 210-639.000.

Zgonik, Miran, to Avtomontaza Ljubljana n.sub.o. Tovarna Gospodarskih vozil, trgovina in servis motornih vozil, TOZD Tovarna grelnih naprav n.sub.o. Thermal power measuring device. 4,538,925, Cl. 374-39.000.

Zibell, J. Scott. Exercising machine and method. 4,538,804, Cl. 272-73.000.

Zichner, Ludwig: *See*—
Dorre, Erhard; Prussner, Peter; and Zichner, Ludwig, 4,538,306, Cl. 623-20.000.

Zillig, Robert G.: *See*—
Hoskins, John T.; Zillig, Robert G.; and Zillig, Steven R., 4,538,679, Cl. 165-178.000.

Zillig, Steven R.: *See*—
Hoskins, John T.; Zillig, Robert G.; and Zillig, Steven R., 4,538,679, Cl. 165-178.000.

Zimm Zamm AG: *See*—
Sinclair, J. Andrew, 4,538,818, Cl. 273-417.000.

Zimmer, Johannes. Method of and apparatus for applying a uniform layer of liquid to a surface. 4,538,541, Cl. 118-258.000.

Zimmerman, Harold M. Motor mounting arrangement on a mixing auger. 4,538,916, Cl. 366-40.000.

Zipfel, Christie L.: *See*—
Camlibel, Irfan; Chin, Aland K.; Chin, Brymer H.; and Zipfel, Christie L., 4,538,342, Cl. 29-569.00L.

Zschocke, Christian: *See*—
Kutscher, Fritz; and Zschocke, Christian, 4,538,699, Cl. 180-125.000.

Zuscik, Edward J., to Crown Zellerbach Corporation. Laminate for making tubes. 4,539,259, Cl. 428-332.000.

Zvejnieks, Andrejs: *See*—
Duncan, John J.; and Zvejnieks, Andrejs, 4,539,368, Cl. 524-748.000.

ZVS Adamovske strojirny, koncernovy podnik: *See*—
Sedlak, Vaclav; and Jiruse, Jaroslav, 4,538,513, Cl. 101-76.000.

Zwicker, Wolfgang, to Webasto-Werk W. Baier GmbH & Co. Vaporization burner. 4,538,985, Cl. 431-262.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF SEPTEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Baker Oil Tools, Inc.: *See*—
McStravick, David M., Re. 31,978, Cl. 166-387.000.

Jung, Michel: *See*—
Metcalf, Brian W.; and Jung, Michel, Re. 31,980, Cl. 562-574.000.

McStravick, David M., to Baker Oil Tools, Inc. Well tool having knitted wire mesh seal means and method of use thereof. Re. 31,978, Cl. 166-387.000.

Merrell Toraude et Compagnie: *See*—
Metcalf, Brian W.; and Jung, Michel, Re. 31,980, Cl. 562-574.000.

Metcalf, Brian W.; and Jung, Michel, to Merrell Toraude et Compagnie. Olefinic derivatives of amino acids. Re. 31,980, Cl. 562-574.000.

Volk, Benjamin: *See*—
Volk, Joseph, Sr., Re. 31,979, Cl. 426-483.000.

Volk, Joseph, Sr., to Volk, Benjamin. Method of hulling pistachio nuts. Re. 31,979, Cl. 426-483.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Arnold, Peter: *See*—
Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., B1 1,028,860, Cl. 175-9.000.

Bendix Corporation, The: *See*—
Driscoll, Barry J., B1 4,355,293, Cl. 338-184.000.

Cherukuri, Subraman R.; Friello, Dominick R.; Ferroti, Michael; Jewell, Walter; and D'Amelia, Ronald P., to Nabisco Brands Inc. Gum base, chewing gum containing same and method. B1 4,352,822, 9-3-85, Cl. 426-4.000.

D'Amelia, Ronald P.: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Ferroti, Michael; Jewell, Walter; and D'Amelia, Ronald P., B1 4,352,822, Cl. 426-4.000.

Driscoll, Barry J., to Bendix Corporation, The. Electrical resistance apparatus having integral shorting protection. B1 4,355,293, 9-3-85, Cl. 338-184.000.

Dunn, Francis P.: *See*—
Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., B1 1,028,860, Cl. 175-9.000.

Du Pont de Nemours, E. I., and Company: *See*—
Wyeth, Nathaniel C.; and Roseveare, Ronald N., B1 3,733,309, Cl. 428-35.000.

Ferroti, Michael: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Ferroti, Michael; Jewell, Walter; and D'Amelia, Ronald P., B1 4,352,822, Cl. 426-4.000.

Friello, Dominick R.: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Ferroti, Michael; Jewell, Walter; and D'Amelia, Ronald P., B1 4,352,822, Cl. 426-4.000.

Imbert, Jean C. Fuel saving device. B1 4,424,786, 9-3-85, Cl. 123-538.000.

Irrigation Specialties Company: *See*—
Lieding, Calvin A., B1 3,967,808, Cl. 251-46.000.

Jewell, Walter: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Ferroti, Michael; Jewell, Walter; and D'Amelia, Ronald P., B1 4,352,822, Cl. 426-4.000.

Kostner, Richard C.: *See*—
Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., B1 4,289,563, Cl. 156-423.000.

Lieding, Calvin A., to Irrigation Specialties Company. Irrigation valve with metal seat. B1 3,967,808, 9-3-85, Cl. 251-46.000.

Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., to Shell Oil Company. Curved offshore well conductors. B1 1,028,860, 9-3-85, Cl. 175-9.000.

Miller, Delmar S.: *See*—
Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., B1 4,289,563, Cl. 156-423.000.

Nabisco Brands Inc.: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Ferroti, Michael; Jewell, Walter; and D'Amelia, Ronald P., B1 4,352,822, Cl. 426-4.000.

Pecheux, Jean-Claude R., to Societe Anonyme: Compagnie Generale De Materiel Orthopedique. Splint. B1 4,323,060, 9-3-85, Cl. 128-84.00R.

Poly-Trusions, Inc.: *See*—
Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., B1 4,289,563, Cl. 156-423.000.

Roseveare, Ronald N.: *See*—
Wyeth, Nathaniel C.; and Roseveare, Ronald N., B1 3,733,309, Cl. 428-35.000.

Shell Oil Company: *See*—
Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., B1 1,028,860, Cl. 175-9.000.

Societe Anonyme: Compagnie Generale De Materiel Orthopedique: *See*—
Pecheux, Jean-Claude R., B1 4,323,060, Cl. 128-84.00R.

Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., to Poly-Trusions, Inc. Grating construction and assembly method and apparatus. B1 4,289,563, 9-3-85, Cl. 156-423.000.

Wyeth, Nathaniel C.; and Roseveare, Ronald N., to Du Pont de Nemours, E. I., and Company. Biaxially oriented poly(ethylene terephthalate) bottle. B1 3,733,309, 9-3-85, Cl. 428-35.000.

LIST OF DESIGN PATENTEES

Aktiebolaget Volvo: *See*—
Wilsgaard, Jan, 280,399, Cl. D12-172.000.

Alex Synn AG: *See*—
Hopfer, Hans, 280,364, Cl. D6-334.000.
Hopfer, Hans, 280,365, Cl. D6-334.000.

Allen, James H., to 'totes', incorporated. Expandable hand and shoulder duffle bag. 280,362, 9-3-85, Cl. D3-71.000.

Amereader Inc.: *See*—
Urbano, Joseph V.; Klein, Jeshayahu; and Schield, Israel, 280,415, Cl. D16-17.000.

American Cyanamid Company: *See*—
Morgan, John H., 280,387, Cl. D9-415.000.

Andersson, Karl A.; and Ferm, Morgan, to Perstop AB. Dish drainer. 280,454, 9-3-85, Cl. D32-55.000.

Appel, Mel; and Kress, George, to Appel, Mel. Toy container. 280,361, 9-3-85, Cl. D3-66.000.

Arad, Avi: *See—*
Kennedy, Melvin; Nagel, Dietmar; and Arad, Avi, 280,428, Cl. D21-59.000.

Arita, Toyomi, to Sanyo Electric Co., Ltd. Hand-held vacuum cleaner. 280,452, 9-3-85, Cl. D32-18.000.

Armistead, Trevor, to Oxley Developments Company Limited. Terminal pin. 280,401, 9-3-85, Cl. D13-24.000.

Aslan, Edward E., to Narda Microwave Corporation, The. Broadband probe. 280,388, 9-3-85, Cl. D10-78.000.

Austin, Arnold S., to Quabaug Rubber Company. Shoe sole. 280,355, 9-3-85, Cl. D2-320.000.

Austin, Arnold S., to Quabaug Rubber Company. Shoe sole. 280,356, 9-3-85, Cl. D2-320.000.

Austin, Hollis B., to Northern Telecom Limited. Telephone line test probe. 280,389, 9-3-85, Cl. D10-78.000.

Baisch, Herbert: *See—*
Ferdinand, Irwin J.; Handler, Milton C.; Sylvan, Richard; and Baisch, Herbert, 280,370, Cl. D6-477.000.

Bakic, Dieter, to Revlon, Inc. Lipstick case. 280,451, 9-3-85, Cl. D28-88.000.

Bayerische Motoren Werke A.G.: *See—*
Luthe, Claus; and Boyer, Boyke, 280,400, Cl. D12-193.000.

Bayly, Peter K., to Roplas Pty. Ltd. Table or the like. 280,371, 9-3-85, Cl. D6-484.000.

Black & Decker, Inc.: *See—*
Somers, Robert I., 280,379, Cl. D8-61.000.

Bohunsky, Robert L. Violin case. 280,359, 9-3-85, Cl. D3-30.100.

Booker, Brian A. J.; and Hillebrand, Thomas W., to Parker Pen Company, The. Fountain pen. 280,422, 9-3-85, Cl. D19-51.000.

Boss, Karen. Oil candle. 280,443, 9-3-85, Cl. D26-110.000.

Boss, Karen. Oil candle. 280,444, 9-3-85, Cl. D26-110.000.

Boss, Karen. Oil candle. 280,445, 9-3-85, Cl. D26-110.000.

Boyer, Boyke: *See—*
Luthe, Claus; and Boyer, Boyke, 280,400, Cl. D12-193.000.

Breslow, Jeffrey D.; Rosenwinkel, Donald A.; and Zaruba, John V., to Marvin Glass & Associates. Candy dispenser. 280,374, 9-3-85, Cl. D7-76.000.

Brown, Paul R. Combined telephone and clock radio. 280,402, 9-3-85, Cl. D14-53.000.

Bryce, Ian R. Litter bin. 280,458, 9-3-85, Cl. D34-7.000.

Bunn-O-Matic Corporation: *See—*
Foley, Henry L., 280,377, Cl. D7-391.000.

Burton, Robert W.; Crowley, Joseph C., Jr.; Davi, Richard A.; and Goertz, Albrecht, to Rolodex Corporation. Covered swivel card file. 280,423, 9-3-85, Cl. D19-76.000.

Cheng, Jung-Tsung; and Lee, Alan Y. T. Adjustable holder for flowers, plants or the like. 280,395, 9-3-85, Cl. D11-146.000.

Cincinnati Incorporated: *See—*
Uroshevich, Miroslav, 280,414, Cl. D15-123.000.

Coats & Clark, Inc.: *See—*
Rossi, Paul, 280,382, Cl. D8-397.000.

Colognori, Aldo. Combined back scrubber and back scratcher with removable sponge element. 280,448, 9-3-85, Cl. D28-63.000.

Colognori, Aldo. Combined back scrubber and back scratcher with removable sponge element. 280,449, 9-3-85, Cl. D28-63.000.

Crespi, Gabriella. Adjustable table. 280,368, 9-3-85, Cl. D6-430.000.

Crowley, Joseph C., Jr.: *See—*
Burton, Robert W.; Crowley, Joseph C., Jr.; Davi, Richard A.; and Goertz, Albrecht, 280,423, Cl. D19-76.000.

Davi, Richard A.: *See—*
Burton, Robert W.; Crowley, Joseph C., Jr.; Davi, Richard A.; and Goertz, Albrecht, 280,423, Cl. D19-76.000.

Delta Products, Inc.: *See—*
Schweitzer, John C., 280,390, Cl. D10-106.000.

Dick, Forrest W.: *See—*
Reamer, Howard J., Jr.; and Dick, Forrest W., 280,367, Cl. D6-429.000.

Dinand, Pierre, to Saint Gobain Desjonqueres. Bottle. 280,385, 9-3-85, Cl. D9-403.000.

Dinand, Pierre, to Saint Gobain Desjonqueres. Bottle. 280,386, 9-3-85, Cl. D9-403.000.

Dyna Electronics, Inc.: *See—*
Walker, Alexander D. R., 280,406, Cl. D14-100.000.

Eldon Industries, Inc.: *See—*
Evenson, Mel, 280,441, Cl. D25-74.000.

Evenson, Mel, to Eldon Industries, Inc. Elongated extrusion. 280,441, 9-3-85, Cl. D25-74.000.

Ferdinand, Irwin J.; Handler, Milton C.; Sylvan, Richard; and Baisch, Herbert, to Hirsh Company. Utility stand. 280,370, 9-3-85, Cl. D6-477.000.

Ferm, Morgan: *See—*
Andersson, Karl A.; and Ferm, Morgan, 280,454, Cl. D32-55.000.

Fields, John, Jr., to Ski Accessories, Inc. Ski and ski pole carrier. 280,360, 9-3-85, Cl. D3-36.000.

Foley, Henry L., to Bunn-O-Matic Corporation. Pot cover. 280,377, 9-3-85, Cl. D7-391.000.

Fukuchi, Eiji, to Mitsuboshi Belting Ltd. Bicycle tire. 280,397, 9-3-85, Cl. D12-136.000.

Gatward, Douglas K. Waste bag holder. 280,457, 9-3-85, Cl. D34-6.000.

Giugiaro, Giorgetto, to Parker Pen Company Limited, The. Writing instrument. 280,421, 9-3-85, Cl. D19-49.000.

Goertz, Albrecht: *See—*
Burton, Robert W.; Crowley, Joseph C., Jr.; Davi, Richard A.; and Goertz, Albrecht, 280,423, Cl. D19-76.000.

Goldblatt Tool Co.: *See—*
Gromer, Robert D., Jr., 280,440, Cl. D25-67.000.

Graves, Louis N., to Louis N. Graves Company, Inc. Sharpening apparatus. 280,380, 9-3-85, Cl. D8-91.000.

Grimes, Gary E., to Timex Computer Corporation. Computer cartridge. 280,413, 9-3-85, Cl. D14-114.000.

Gromer, Robert D., Jr., to Goldblatt Tool Co. Adjustable trestle. 280,440, 9-3-85, Cl. D25-67.000.

GTE Business Communication Systems: *See—*
Mitchell, Michael, 280,403, Cl. D14-53.000.

GTE Business Communication Systems Inc.: *See—*
Mitchell, Michael, 280,405, Cl. D14-62.000.

Handler, Milton C.: *See—*
Ferdinand, Irwin J.; Handler, Milton C.; Sylvan, Richard; and Baisch, Herbert, 280,370, Cl. D6-477.000.

Hari & Associates, Inc.: *See—*
Matsuda, Hari, 280,366, Cl. D6-425.000.

Hayashi, Shigeaki; Sawada, Masaji; Sakaguchi, Hiroshi; and Yamada, Kazuo, to Sharp Corporation. Electronic printing calculator. 280,418, 9-3-85, Cl. D18-7.000.

Hestair Kiddicraft Limited: *See—*
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 280,429, Cl. D21-65.000.

Hillebrand, Thomas W.: *See—*
Booker, Brian A. J.; and Hillebrand, Thomas W., 280,422, Cl. D19-51.000.

Hirsh Company: *See—*
Ferdinand, Irwin J.; Handler, Milton C.; Sylvan, Richard; and Baisch, Herbert, 280,370, Cl. D6-477.000.

Holman, Edward. Puzzle toy. 280,430, 9-3-85, Cl. D21-104.000.

Hopfer, Hans, to Alex Synn AG. Seat. 280,364, 9-3-85, Cl. D6-334.000.

Hopfer, Hans, to Alex Synn AG. Sofa. 280,365, 9-3-85, Cl. D6-334.000.

Inaba, Hiroshi, to Nippon Tsushin Kogyo Kabushiki Kaisha. Telephone set. 280,404, 9-3-85, Cl. D14-58.000.

Interlego A.G.: *See—*
Tapdrup, Erik P.; and Thomsen, Sven Carsten B., 280,431, Cl. D21-108.000.
Tapdrup, Erik P., 280,432, Cl. D21-108.000.

International Business Machines Corporation: *See—*
Switser, Gary L., 280,416, Cl. D16-32.000.

Ioakim, Peter. Storage rack for safety razors. 280,373, 9-3-85, Cl. D6-526.000.

Ishii, Motoko. Lamp globe. 280,446, 9-3-85, Cl. D26-130.000.

Ivanko Barbell Company: *See—*
Lincir, Tom I., 280,433, Cl. D21-191.000.

Jones, Karen K. Game card back. 280,427, 9-3-85, Cl. D21-47.000.

Kasting, Richard H.: *See—*
Tendick, Edwin W.; and Kasting, Richard H., 280,383, Cl. D9-345.000.

Kennedy, Melvin; Nagel, Dietmar; and Arad, Avi, to Nagel/Kennedy & Associates. Drawing toy. 280,428, 9-3-85, Cl. D21-59.000.

Klein, Jeshayahu: *See—*
Urbano, Joseph V.; Klein, Jeshayahu; and Schield, Israel, 280,415, Cl. D16-17.000.

Koprivica, George T. Flute and piccolo player's lyre. 280,417, 9-3-85, Cl. D17-99.000.

Kress, George: *See—*
Appel, Mel; and Kress, George, 280,361, Cl. D3-66.000.

Krop, Hugo K., to Text Lite BV. Display device. 280,424, 9-3-85, Cl. D20-10.000.

Kuba, Lawrence M., to Wang Laboratories, Inc. Keyboard. 280,408, 9-3-85, Cl. D14-100.000.

Kuechler, Steven C.; and Raspotnik, Mark E. Display rack attachment for small packaged articles or the like. 280,372, 9-3-85, Cl. D6-509.000.

Landis, Harry M. Roman numeral electro-optical display. 280,419, 9-3-85, Cl. D18-26.000.

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ISSUED SEPTEMBER 3, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

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207.16 4,538,607
303.1 4,538,608
4,538,609
303.15 4,538,610
305 4,538,611
333 4,538,612
395 4,538,613
494 4,538,614
555 4,538,615
632 4,538,616
635 4,538,617
663 4,538,618
702 4,538,619
725 4,538,620
748 4,538,621
772 4,538,622
784 4,538,623
4,538,624

CLASS 130

27 JT 4,538,625

CLASS 131

84.4 4,538,626
276 4,538,627
277 4,538,628
282 4,538,629

CLASS 132

33 R 4,538,630
84 R 4,538,631

CLASS 136

258 4,539,431

CLASS 137

77 4,538,632
85 4,538,633
103 4,538,634
114 4,538,635
216 4,538,636
360 4,538,637
375 4,538,638
580 4,538,639
596 4,538,640
596.1 4,538,641
625.28 4,538,642
625.64 4,538,643
4,538,644
625.65 4,538,645
883 4,538,646

CLASS 138

166 4,538,647

CLASS 139

79 4,538,648
435 4,538,649
452 4,538,650

CLASS 141

1 4,538,651
57 4,538,652
285 4,538,653

CLASS 144

1 F 4,538,654
230 4,538,655
378 4,538,656

CLASS 148

1.5 4,539,050
6.15 Z 4,539,051
6.24 4,539,052
19 4,539,053
403 4,539,054

CLASS 152

375 4,538,657
427 4,538,658

CLASS 156

92 4,539,055
183 4,539,056
212 4,539,057
250 4,539,058

251 4,539,059
275.1 4,539,060
278 4,539,061
345 4,539,062
361 4,539,063
379.7 4,539,064
423 B1 4,289,563
475 4,539,065
479 4,539,066
601 4,539,067
614 4,539,068
640 4,539,069
659.1 4,539,070

CLASS 157

1 4,538,659
20 4,538,660

CLASS 160

35 4,538,661
107 4,538,662
368 R 4,538,663

CLASS 162

161 4,539,071
197 4,539,072
198 4,539,073
4,539,074
343 4,539,075

CLASS 164

37 4,538,664
160.1 4,538,665
305 4,538,666
418 4,538,667
448 4,538,668
451 4,538,669
475 4,538,670
514 4,538,671

CLASS 165

27 4,538,672
45 4,538,673
70 4,538,674
80 C 4,538,675
145 4,538,676
146 4,538,677
162 4,538,678
178 4,538,679

CLASS 166

55 4,538,680
125 4,538,681
255 4,538,682
264 4,538,683
277 4,538,684
321 4,538,685
387 Re.31,978

CLASS 171

16 4,538,686
4,538,687

CLASS 172

555 4,538,688
700 4,538,689

CLASS 174

15 C 4,539,432
35 MS 4,539,433
68.5 4,539,434

CLASS 175

9 B1 Re.28,860
329 4,538,690
393 4,538,691

CLASS 177

1 4,538,692
25 4,538,693
145 4,538,694

CLASS 179

2 A 4,539,435
6.04 4,539,436
18 ES 4,539,437
18 FA 4,539,438
107 E 4,539,440
107 R 4,539,439
111 E 4,539,441
115.5 VC 4,539,442
170 D 4,539,443

CLASS 180

19.2 4,538,695
19.3 4,538,696
68.4 4,538,697
79.1 4,538,698
125 4,538,699
248 4,538,700

CLASS 181

274 4,538,701

CLASS 182

3 4,538,702
5 4,538,703
10 4,538,704
142 4,538,705

CLASS 187

90 4,538,706

CLASS 188

24.22 4,538,707
73.38 4,538,708

CLASS 190

18 A 4,538,709

CLASS 192

0.094 4,538,717
13 A 4,538,710
18 R 4,538,711
4,538,712
54 4,538,713
4,538,714
56 R 4,538,715
70.29 4,538,716
106.2 4,538,718

CLASS 194

100 A 4,538,719

CLASS 198

416 4,538,720
774 4,538,721
861.2 4,538,722

CLASS 200

5 A 4,539,445
5 R 4,539,444
16 R 4,539,446
61.91 4,539,447
144 AP 4,539,448
146 R 4,539,449
147 R 4,539,451
148 F 4,539,450
334 4,539,452

CLASS 202

154 4,539,076

CLASS 203

49 4,539,077

CLASS 204

1 R 4,539,078
5 4,539,079
74 4,539,080
78 4,539,081
93 4,539,082
98 4,539,083
4,539,084
4,539,085
129 4,539,086
146 4,539,087
182.5 4,539,088
192 R 4,539,089
198 4,539,090
301 4,539,091
415 4,539,092

CLASS 206

3 4,538,723
4,538,724
37 4,538,725
44.12 4,538,726
223 4,538,727
315.3 4,538,728
387 4,538,729
444 4,538,730
540 4,538,731
613 4,538,732

CLASS 208

8 LE 4,539,093
4,539,094
4,539,095
11 LE 4,539,097
4,539,098
11 R 4,539,096
177 4,539,099
188 4,539,100
251 H 4,539,101

CLASS 209

3.1 4,538,733
38 4,539,102
158 4,539,103
172.5 4,539,104
211 4,539,105
668 4,538,734
691 4,538,735

CLASS 210

88 4,539,106
96.1 4,539,107
104 4,539,108
4,539,109
150 4,539,110
179 4,539,111
219 4,539,112
323.2 4,539,113
330 4,539,114
409 4,539,115
445 4,539,116
639 4,539,117
683 4,539,118
711 4,539,119
738 4,539,120
751 4,539,121

CLASS 211

69.5 4,538,736
71 4,538,737
162 4,538,738
189 4,538,739

CLASS 215

246 4,538,740
320 4,538,741

CLASS 219

10.55 C 4,539,453
10.55 E 4,539,455
10.55 F 4,539,454
10.69 4,539,456
58 4,539,457
69 M 4,539,458
69 W 4,539,459
73.21 4,539,460
121 L 4,539,461
121 LG 4,539,463
121 LV 4,539,462
137 R 4,539,464
137.7 4,539,465
203 4,539,466
233 4,539,467
330 4,539,468
412 4,539,469

CLASS 220

21 4,538,742
375 4,538,743

CLASS 222

36 4,538,744
153 4,538,745
4,538,746
4,538,747
260 4,538,748
321 4,538,749
386.5

CLASS 224

156 4,538,750
252 4,538,751
309 4,538,752

CLASS 226

199 4,538,753

CLASS 227

67 4,538,754
152 4,538,755

CLASS 228

118 4,538,756
180.1 4,538,757

CLASS 229

4.5 4,538,758
52 B 4,538,759

CLASS 235

98 B 4,539,470
201 PF 4,539,471
488 4,539,472

CLASS 237

2 A 4,538,760

CLASS 239

196 4,538,761
232 4,538,762
600 4,538,763

CLASS 241

5 4,538,764
21 4,538,765
30 4,538,766
79.3 4,538,767
101.2 4,538,768
179 4,538,769

CLASS 242

1.1 R 4,538,770
7.12 4,538,771
18 G 4,538,773
18 R 4,538,772
107 4,538,774
129.51 4,538,775
131 4,538,776

CLASS 244

1 R 4,538,777
75 R 4,538,778
87 4,538,779
123 4,538,780

CLASS 246

187 B 4,538,781

CLASS 248

68.1 4,538,782
99 4,538,783
244 4,538,784
268 4,538,785
544 4,538,786

CLASS 249

112 4,538,787

CLASS 250

211 R 4,539,473
221 4,539,474
227 4,539,476
231 P 4,539,475
235 4,539,478
310 4,539,477
491.1 4,539,479
551 4,539,480
557 4,539,481
578 4,539,482

CLASS 251

46 B1 3,967,808
107 4,538,788
129.12 4,538,789
214 4,538,790
339 4,538,791

CLASS 252

8.55 R 4,539,122
8.8 4,539,123
28 4,539,124
32.7 E 4,539,125
39 4,539,126
47.5 4,539,127
49.3 4,539,128
62.2 4,539,146
62.63 4,539,129
94 4,539,130
95 4,539,132
99 4,539,131
109 4,539,133
156 4,539,134
174.11 4,539,135
301.4 H 4,539,137
4,539,138
314 4,539,139
391 4,539,140
516 4,539,141
522 R 4,539,142
4,539,143
526 4,539,144
542 4,539,145

CLASS 254

18 4,538,793

CLASS 259

8 R 4,538,792

CLASS 260

112.5 R 4,539,147
4,539,155
239 A 4,539,148
239.1 4,539,149
239.3 B 4,539,150
4,539,151
245.2 T 4,539,152
397.2 4,539,153
410.9 N 4,539,154
453 SP 4,539,156
4,539,157
4,539,158
465 E 4,539,161
465 F 4,539,159
4,539,160

CLASS 261

1 4,539,162
34 A 4,539,163
114 A 4,539,164

CLASS 264

23 4,539,165
45.1 4,539,166
51 4,539,167
102 4,539,168
171 4,539,169
176 F 4,539,170
328.8 4,539,171
515 4,539,172
570 4,539,173

CLASS 266

79 4,538,794
220 4,538,795
265 4,539,043

CLASS 269

17 4,538,796
27 4,538,797
289 R 4,538,798

CLASS 271

9 4,538,799
120 4,538,800
251 4,538,801

CLASS 272

1 R 4,538,802
31 R 4,538,803
73 4,538,804
118 4,538,805
122 4,538,806
146 4,538,807

CLASS 273

1.5 A 4,538,808
18 4,538,809
26 D 4,538,810
31 4,538,811
73 R 4,538,812
150 4,538,813
176 F 4,538,814
187 R 4,538,815
256 4,538,816
380 4,538,817
417 4,538,818

CLASS 277

4 4,538,819
11 4,538,820
81 R 4,538,821
207 A 4,538,822

CLASS 279

37 4,538,823

CLASS 280

91 4,538,824
242 WC 4,538,825
4,538,826
507 4,538,827
628 4,538,828
641 4,538,829
647 4,538,830
666 4,538,831
808 4,538,832

CLASS 281

2 4,538,833

CLASS 285

10 4,538,834
12 4,538,835
24 4,538,836
55 4,538,837
91 4,538,838
236 4,538,839
333 4,538,840
337 4,538,841
354 4,538,842

CLASS 290

1 R 4,539,483
53 4,539,484
4,539,485

CLASS 292

113 4,538,843
127 4,538,844
216 4,538,845

CLASS 294

8.6 4,538,846
51 4,538,847
68.23 4,538,848
81.1 4,538,849
89 4,538,850

CLASS 296

1 S 4,538,851
91 4,538,852

CLASS 297

339 4,538,853
345 4,538,854
362 4,538,855
367 4,538,856
437 4,538,857

CLASS 299

55 4,538,858

CLASS 303

24 R 4,538,859

CLASS 305

56 4,538,860

CLASS 307

34 4,539,486
44 4,539,487
261 4,539,488
290 4,539,489
296 R 4,539,490
297 4,539,491
315 4,539,492
455 4,539,493
530 4,539,494
4,539,495

CLASS 310

68 B 4,539,496
75 R 4,539,497
87 4,539,498
214 4,539,499
230 4,539,500
313 A 4,539,501
313 B 4,539,502

CLASS 312

244 4,538,861
283 4,538,862

CLASS 313

11.5 4,539,503
113 4,539,504
315 4,539,505
467 4,539,506
493 4,539,510
504 4,539,507
546 4,539,508
623 4,539,509
624 4,539,511

CLASS 315

5.35 4,539,512
176 4,539,513

CLASS 318

778 4,539,514

CLASS 320

17 4,539,515
48 4,539,516

CLASS 324

73 R 4,539,517
77 B 4,539,518
117 H 4,539,520
117 R 4,539,519
244 4,539,521
245 4,539,522

CLASS 328

141 4,539,523

CLASS 329

50 4,539,524

CLASS 330

107 4,539,525
144 4,539,526
149 4,539,527
287 4,539,528
295 4,539,529

CLASS 331

11 4,539,531
69 4,539,532
117 FE 4,539,530

CLASS 332

9 R 4,539,533

CLASS 333

115 4,539,534
164 4,539,535
165 4,539,536
4,539,537

CLASS 335

16 4,539,538
78 4,539,539
125 4,539,540
132 4,539,541
261 4,539,542
281 4,539,543
296 4,539,544

CLASS 337

380 4,539,545

CLASS 338

176 4,539,546
184 B1 4,355,293

CLASS 339

12 R 4,538,863
17 CF 4,538,864
4,538,867
17 F 4,538,865
17 LM 4,538,866
22 B 4,538,879
34 4,538,868
59 M 4,538,869
75 M 4,538,870
4,538,871
97 P 4,538,872
99 R 4,538,873
4,538,874
103 R 4,538,875
118 R 4,538,876
156 R 4,538,877
217 R 4,538,878

CLASS 340

59 4,539,547
63 4,539,548
146.2 4,539,549
347 AD 4,539,550
4,539,551
347 DA 4,539,552
4,539,553
500 4,539,555
515 4,539,556

539 4,539,557
572 4,539,558
573 4,539,559
4,539,560
657 4,539,562
675 4,539,561
735 4,539,563
825.79 4,539,564

CLASS 343

14 4,539,565
351 4,539,567
389 4,539,566

CLASS 345

365 A 4,539,554

CLASS 346

1.1 4,539,568
75 4,539,570
76 PH 4,539,571
135.1 4,539,572
137 4,539,573
139 R 4,539,574
140 R 4,539,569
4,539,575
165 4,539,576
207 4,539,577
4,539,578
218 4,539,579

CLASS 350

6.6 4,538,880
96.23 4,538,881
255 4,538,882
356 4,538,883
361 4,538,884
529 4,538,885
630 4,538,886

CLASS 351

167 4,538,887
205 4,538,888
4,538,889

CLASS 354

21 4,538,890
289.1 4,538,891
402 4,538,892
412 4,538,893
467 4,538,894

CLASS 355

3 DD 4,538,897
4,538,898
3 R 4,538,895
4,538,896
10 4,538,899
14 CH 4,538,900
14 E 4,538,901
14 FU 4,538,902
14 SH 4,538,905
4,538,906
57 4,538,903
4,538,904

CLASS 356

1 4,538,907
36 4,538,908
237 4,538,909
346 4,538,910
358 4,538,911
366 4,538,912
371 4,538,913
400 4,538,914
431 4,538,915

CLASS 357

23 4,539,580
58 4,539,581
71 4,539,582

CLASS 358

27 4,539,583
44 4,539,584
93 4,539,585
98 4,539,586
107 4,539,587
113 4,539,588
4,539,589
125 4,539,590
140 4,539,592
160 4,539,593
167 4,539,594
210 4,539,595
213 4,539,596
4,539,597
4,539,598
254 4,539,599
282 4,539,600
335 4,539,591
4,539,601
337 4,539,602

CLASS 360

10.1 4,539,603
10.2 4,539,604
32 4,539,605
70 4,539,606
77 4,539,607
4,539,608
93 4,539,609
4,539,610
99 4,539,611
4,539,612
4,539,613
4,539,614
121 4,539,615
125 4,539,616

CLASS 361

58 4,539,617
94 4,539,618
151 4,539,619
275 4,539,620
386 4,539,621
401 4,539,622
433 4,539,623

CLASS 362

16 4,539,624
32 4,539,625
66 4,539,626
72 4,539,627
217 4,539,628
267 4,539,629
318 4,539,630
351 4,539,631

CLASS 364

143 4,539,632
162 4,539,633
167 4,539,634
200 4,539,635
4,539,636
4,539,637
300 4,539,638
414 4,539,639
4,539,640
424 4,539,641
426 4,539,642
431.09 4,539,643
467 4,539,644
478 4,539,645
484 4,539,646
526 4,539,647
555 4,539,648
558 4,539,649
567 4,539,650
822 4,539,651
900 4,539,652
4,539,653
4,539,654
4,539,655
4,539,656

CLASS 365

45 4,539,657
207 4,539,658
226 4,539,659
229 4,539,660
230 4,539,661

CLASS 366

40 4,538,916
75 4,538,917
160 4,538,918
162 4,538,919
177 4,538,920
178 4,538,921
318 4,538,922

CLASS 368

70 4,538,923
74 4,538,924

CLASS 369

13 4,539,662
34 4,539,663
44 4,539,664
4,539,665
50 4,539,666
4,539,667
75.2 4,539,668
4,539,669
77.1 4,539,670
213 4,539,671
244 4,539,672
284 4,539,673

CLASS 370

32 4,539,674
4,539,675
60 4,539,676
85 4,539,677
86 4,539,678
88 4,539,679
100 4,539,680
119 4,539,681

CLASS 371

15 4,539,682
4,539,683
46 4,539,684

CLASS 372

25 4,539,685
26 4,539,686
43 4,539,687

CLASS 373

67 4,539,688

CLASS 374

39 4,538,925
150 4,538,926
163 4,538,927

CLASS 375

13 4,539,689
14 4,539,690
37 4,539,691
98 4,539,692
110 4,539,693

CLASS 376

261 4,539,174

CLASS 377

42 4,539,694

CLASS 378

34 4,539,695
181 4,539,696

CLASS 381

7 4,539,697
70 4,539,698
4,539,699
90 4,539,700

CLASS 382

1 4,539,701
7 4,539,702
28 4,539,703
55 4,539,704

CLASS 383

8 4,539,705

CLASS 384

96 4,538,928
120 4,538,929

CLASS 400

144.2 4,538,930
185 4,538,931
4,538,932
582 4,538,933

CLASS 401

53 4,538,934

CLASS 403

140 4,538,935
402 4,538,936

CLASS 405

168 4,538,937
198 4,538,938
205 4,538,939
259 4,538,940

CLASS 406

143 4,538,941

CLASS 408

14 4,538,942
4,538,943
72 B 4,538,354
206 4,538,944

CLASS 409

157 4,538,945
179 4,538,946

CLASS 411

393 4,538,947

CLASS 414

24.6 4,538,948
4,538,949
222 4,538,950
407 4,538,951
458 4,538,952
608 4,538,953
633 4,538,954
686 4,538,955
735 4,538,956

CLASS 415

1 4,538,957
53 T 4,538,958
98 4,538,959
104 4,538,960

CLASS 416

114 4,538,961
146 R 4,538,962
203 4,538,963

CLASS 417

267 4,538,964
273 4,538,965
288 4,538,966
360 4,538,967
368 4,538,968
407 4,538,969
417 4,538,970
423 A 4,538,971
540 4,538,972
572 4,538,973

CLASS 418

26 4,538,974
55 4,538,975
133 4,538,976
150 4,538,977

CLASS 419

6 4,539,197
49 4,539,175

CLASS 420

463 4,539,176
4,539,177
555 4,539,178

CLASS 422

28 4,539,179
58 4,539,180
59 4,539,181
99 4,539,182
143 4,539,183
170 4,539,184
233 4,539,185

CLASS 423

62 4,539,186
132 4,539,187
210 4,539,188
220 4,539,189
240 4,539,190
275 4,539,191
321 R 4,539,192
328 4,539,193
348 4,539,194
419 P 4,539,195
588 4,539,196

CLASS 424

19 4,539,198
22 4,539,199
81 4,539,200
92 4,539,201
114 4,539,202
117 4,539,203

CLASS 425

206 4,538,978

CLASS 426

3 4,539,209
4 B1 4,352,822
56 4,539,210
291 4,539,211
325 4,539,212
483 Re.31,979
512 4,539,213
557 4,539,214
589 4,539,215
597 4,539,216

CLASS 427

10 4,539,217
27 4,539,218
32 4,539,219
44 4,539,220
53.1 4,539,221
88 4,539,222
102 4,539,223
150 4,539,225
163 4,539,226
179 4,539,227
180 4,539,228
190 4,539,224
215 4,539,229
230 4,539,230
255 4,539,231
387 4,539,232
388.1 4,539,233
393.5 4,539,234
440 4,539,235

CLASS 428

35 4,539,236
B1 3,733,309
40 4,539,237
43 4,539,238
4,539,239
64 4,539,240
71 4,539,241
92 4,539,242
99 4,539,243
116 4,539,244
4,539,245
131 4,539,246
138 4,539,247
161 4,539,248
175 4,539,249
195 4,539,250
216 4,539,251
218 4,539,252
22[illegible] 4,539,253
236 4,539,254
252 4,539,255
315.5 4,539,256
323 4,539,257
324 4,539,258
332 4,539,259
336 4,539,260
403 4,539,261
407 4,539,262
500 4,539,263
621 4,539,264
4,539,265
695 4,539,266

CLASS 429

17 4,539,267
54 4,539,268
4,539,269
91 4,539,270
94 4,539,271
4,539,272
4,539,273
4,539,274
152 4,539,275
191 4,539,276
249 4,539,277

CLASS 430

5 4,539,278
30 4,539,279
39 4,539,280
45 4,539,281
59 4,539,282
61 4,539,283
110 4,539,284
157 4,539,285
277 4,539,286
300 4,539,287
325 4,539,288
506 4,539,289
569 4,539,290
597 4,539,291

CLASS 431

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	CLASS 528	481	4,539,396	335	4,539,404		CLASS 549	053	4,539,419	92	4,539,426
79	4,539,384		CLASS 534	367	4,539,405	27	4,539,412	056	4,539,420	132	4,539,427
100	4,539,385	556	4,539,397		CLASS 546	366	4,539,413	105	4,539,421	430	4,539,428
183	4,539,386		CLASS 536	14	4,539,406	458	4,539,414	155	4,539,422	511	4,539,430
232	4,539,387	21	4,539,398	87	4,539,407	475	4,539,415	204	4,539,423		CLASS 604
271	4,539,388	103	4,539,399	139	4,539,408	496	4,539,416		4,539,424	93	4,539,003
272	4,539,389		CLASS 544	286	4,539,409		CLASS 556		CLASS 562	131	4,539,004
303	4,539,390	47	4,539,400		CLASS 548	435	4,539,417	412	4,539,425	141	4,539,005
323	4,539,391	101	4,539,401	336	4,539,410	451	4,539,418	574	Re.31,980		CLASS 623
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D2—	320	280,355		526	280,373	D11—	70	280,391			280,410	D21—	4	280,426		110	280,443
		280,356	D7—	76	280,374			280,392			280,411		47	280,427			280,444
	400	280,357		137	280,375			280,393		111	280,412		59	280,428			280,445
		280,358			280,376			280,394		113	280,407		65	280,429		130	280,446
D3—	30.1	280,359		391	280,377		146	280,395		114	280,413		104	280,430	D28—	42	280,447
	36	280,360	D8—	30	280,378	D12—	116	280,396	D15—	123	280,414		108	280,431		63	280,448
	66	280,361		61	280,379		136	280,397	D16—	17	280,415			280,432			280,449
	71	280,362		91	280,380		171	280,398		32	280,416		191	280,433		78	280,450
D6—	301	280,363		330	280,381		172	280,399	D17—	99	280,417		198	280,434		88	280,451
	334	280,364		397	280,382		193	280,400	D18—	7	280,418		230	280,435	D32—	18	280,452
		280,365	D9—	345	280,383	D13—	24	280,401		26	280,419		252	280,436			280,453
	425	280,366		370	280,384	D14—	53	280,402	D19—	48	280,420	D23—	23	280,437		55	280,454
	429	280,367		403	280,385			280,403		49	280,421		71	280,438		73	280,455
	430	280,368			280,386		58	280,404		51	280,422	D25—	11	280,439		74	280,456
	468	280,369		415	280,387		62	280,405		76	280,423		67	280,440	D34—	6	280,457
	477	280,370	D10—	78	280,388		100	280,406	D20—	10	280,424		74	280,441		7	280,458
	484	280,371			280,389			280,408			280,425	D26—	38	280,442		8	280,459
	509	280,372		106	280,390			280,409									

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DESIGN PATENTS

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06 : 280,367
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08 : 280,390
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20 : 280,372
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27 : 280,380
29 : 280,439
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36 : 280,375
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37 : 280,379
39 : 280,363
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42 : 280,381
44 : 280,447
45 : 280,383
51 : 280,456
53 : 280,459

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45 : 5,547

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